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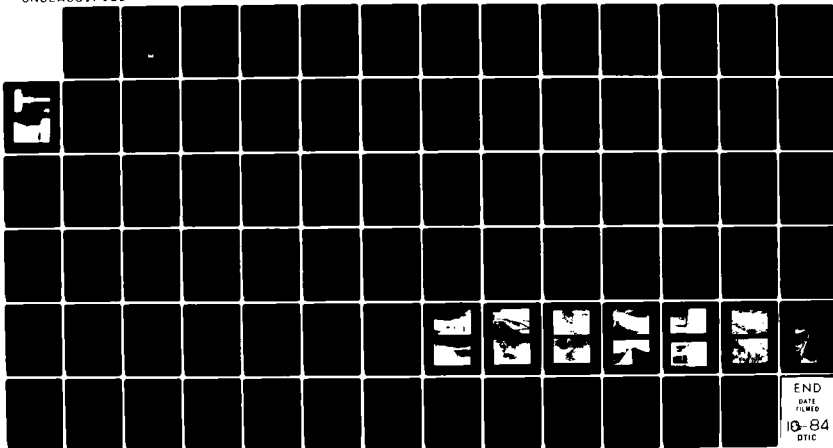
NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS  
WHITING STREET POND D..(U) CORPS OF ENGINEERS WALTHAM  
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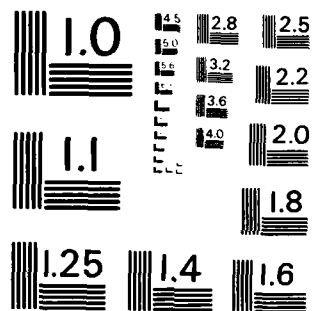
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CONNECTICUT RIVER BASIN  
HOLYOKE, MASSACHUSETTS

AD-A145 656

WHITING STREET POND DAM  
MA 00070

PHASE 1 INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM

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DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION, CORPS OF ENGINEERS  
WALTHAM, MASS. 02154

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AUGUST 1978

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4. TITLE (and Subtitle) Whiting Street Pond Dam  NATIONAL PROGRAM FOR INSPECTION OF NON-FEDERAL DAMS		5. TYPE OF REPORT & PERIOD COVERED INSPECTION REPORT
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9. PERFORMING ORGANIZATION NAME AND ADDRESS		8. CONTRACT OR GRANT NUMBER(s)
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14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		12. REPORT DATE August 1978
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19. KEY WORDS (Continue on reverse side if necessary and identify by block number) DAMS, INSPECTION, DAM SAFETY, Connecticut River Basin Holyoke, Massachusetts		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Whiting Street Pond Dam is an earth-buttressed stone masonry dam, 1900 feet long with a maximum height of about 19 feet. The project is considered to be in fair condition. The dam is classified as intermediate in size, with a high hazard potential, the test flood is the PMF.		



DEPARTMENT OF THE ARMY  
NEW ENGLAND DIVISION CORPS OF ENGINEERS  
424 TRAFALG ROAD  
WALTHAM, MASSACHUSETTS 02154

NEDED-E

AUG 31 1979

Honorable Edward J. King  
Governor of the Commonwealth of  
Massachusetts  
State House  
Boston, Massachusetts

Dear Governor King:

Inclosed is a copy of the Whiting Street Pond Dam Phase I Inspection Report, which was prepared under the National Program for Inspection of Non-Federal Dams. The report is based upon a visual inspection, a review of past performance, and a preliminary hydrological analysis. A brief assessment is included at the beginning of the report.

The preliminary hydrologic analysis has indicated that the spillway capacity for the Whiting Street Pond Dam would likely be exceeded by floods greater than 3 percent of the Probable Maximum Flood (PMF), the test flood for spillway adequacy. Our screening criteria specifies that a dam of this class which does not have sufficient spillway capacity to discharge fifty (50) percent of the PMF, should be adjudged as having a seriously inadequate spillway and the dam assessed as unsafe, non-emergency, until more detailed studies prove otherwise or corrective measures are completed.

The term "unsafe" applied to a dam because of an inadequate spillway does not indicate the same degree of emergency as that term would if applied because of structural deficiency. It does indicate, however, that a severe storm may cause overtopping and possible failure of the dam, with significant damage and potential loss of life downstream.

It is recommended that within twelve months from the date of this report the owner of the dam engage the services of a professional or consulting engineer to determine by more sophisticated methods and procedures the magnitude of the spillway deficiency. Based on this determination, appropriate remedial mitigating measures should be designed and completed within 24 months of this date of notification. In the interim a detailed emergency operation plan and warning system should be promptly developed. During periods of unusually heavy precipitation, the dam should be closely monitored and the spillway kept clear of debris.



**WHITING STREET POND DAM  
MA 00070**

**CONNECTICUT, RIVER BASIN  
HOLYOKE, MASSACHUSETTS**

**PHASE 1 INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM**

## PREFACE

This report is prepared under guidance contained in the Recommended Guidelines for Safety Inspection of Dams, for Phase I Investigations. Copies of these guidelines may be obtained from the Office of Chief of Engineers, Washington, D.C. 20314. The purpose of a Phase I Investigation is to identify expeditiously those dams which may pose hazards to human life or property. The assessment of the general condition of the dam is based upon available data and visual inspections. Detailed investigation, and analyses involving topographic mapping, subsurface investigations, testing, and detailed computational evaluations are beyond the scope of a Phase I investigation; however, the investigation is intended to identify any need for such studies.

In reviewing this report, it should be realized that the reported condition of the dam is based on observations of field conditions at the time of inspection along with data available to the inspection team. In cases where the reservoir was lowered or drained prior to inspection, such action, while improving the stability and safety of the dam, removes the normal load on the structure and may obscure certain conditions which might otherwise be detectable if inspected under the normal operating environment of the structure.

It is important to note that the condition of a dam depends on numerous and constantly changing internal and external conditions, and is evolutionary in nature. It would be incorrect to assume that the present condition of the dam will continue to represent the condition of the dam at some point in the future. Only through continued care and inspection can there be any chance that unsafe conditions be detected.

Phase I inspections are not intended to provide detailed hydrologic and hydraulic analyses. In accordance with the established Guidelines, the Spillway Test flood is based on the estimated "Probable Maximum Flood" for the region (greatest reasonably possible storm runoff), or fractions thereof. Because of the magnitude and rarity of such a storm event, a finding that a spillway will not pass the test flood should not be interpreted as necessarily posing a highly inadequate condition. The test flood provides a measure of relative spillway capacity and serves as an aide in determining the need for more detailed hydrologic and hydraulic studies, considering the size of the dam, its general condition and the downstream damage potential.



This Phase I Inspection Report on Whiting Street Pond Dam has been reviewed by the undersigned Review Board members. In our opinion, the reported findings, conclusions, and recommendations are consistent with the Recommended Guidelines for Safety Inspection of Dams, and with good engineering judgment and practice, and is hereby submitted for approval.



CHARLES G. TIERSCH, Chairman  
Chief, Foundation and Materials Branch  
Engineering Division

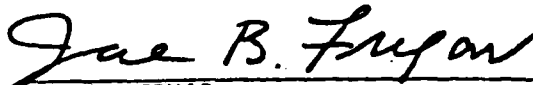


FRED J. RAVENS, Jr., Member  
Chief, Design Branch  
Engineering Division



SAUL COOPER, Member  
Chief, Water Control Branch  
Engineering Division

APPROVAL RECOMMENDED:



JOE B. FRYAR  
Chief, Engineering Division

CONNECTICUT RIVER BASIN  
WHITING STREET POND DAM  
INVENTORY NO. MA 00070  
PHASE I INSPECTION REPORT

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## PHASE I REPORT

### NATIONAL DAM INSPECTION PROGRAM

Inventory No.:	MA 00070
Name of Dam:	WHITING STREET POND DAM
Town Located:	HOLYOKE
County Located:	HAMPDEN
Stated Located:	COMMONWEALTH OF MASSACHUSETTS
Date of Inspection:	2 AUGUST 1978

### BRIEF ASSESSMENT

Whiting Street Pond Dam is an earth-buttressed stone masonry dam, 1900 feet long with a maximum height of about 19 feet. A two level stone masonry and concrete spillway is located about 70 feet from the dam's south abutment. A gatehouse and gate chamber are located at approximately the center of the dam and contain the operating mechanisms for controlling the outflows into the City's Water Supply and to the low level outlet. Discharges from the low level outlet and the spillway converge and flow into an unnamed creek before emptying into the Connecticut River.

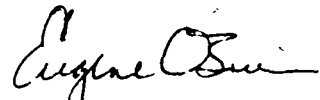
Phase I inspection and evaluation of Whiting Street Pond Dam does not indicate conditions which would constitute an immediate hazard to human life or property. Based on engineering judgement and the performance of the dam and the outlet works, the project is considered to be in fair condition. The project, however, does have a number of deficiencies which, if not remedied, have the potential for developing into hazardous conditions.

Because there are no data on Probable Maximum Floods for a drainage area of 1.67 square miles, it was necessary to synthesize a test flood hydrograph for the contributing area. Since the dam is classified as intermediate in size, with a high hazard potential, the test flood, in accordance with Corps of Engineers guidelines, is the Probable Maximum Flood (PMF). The PMF yields an outflow of 8253 cfs which is greater than the maximum discharge capacity of the spillway of 215 cfs and would result in an overtopping of the dam by about 1.4 feet. (The discharge from the low level outlet could not be computed, however, it would be extremely small.) Since the dam will be overtopped by the test flood by a large amount, it is considered that the spillway is very inadequate from a hydraulic and hydrologic viewpoint. Furthermore, because of the anticipated overtopping there is a question of whether the dam would be stable under this condition. Therefore, a number of recom-

mendations are given for implementation by the owner, within 12 months of receipt of this Phase I Inspection Report, for providing adequate spillway capacity. This includes retaining a competent consulting engineer to conduct further hydraulic studies and in the interim period to maintain the reservoir at a lower level.

In addition, remedial measures are recommended for implementation by the owner within 24 months of receipt of this Phase I Inspection Report to improve overall conditions. These measures, in general, are as follows:

- Programs for observing and monitoring seepage
- Repairs to embankments and appurtenant structures
- Programs for operation, maintenance and inspection

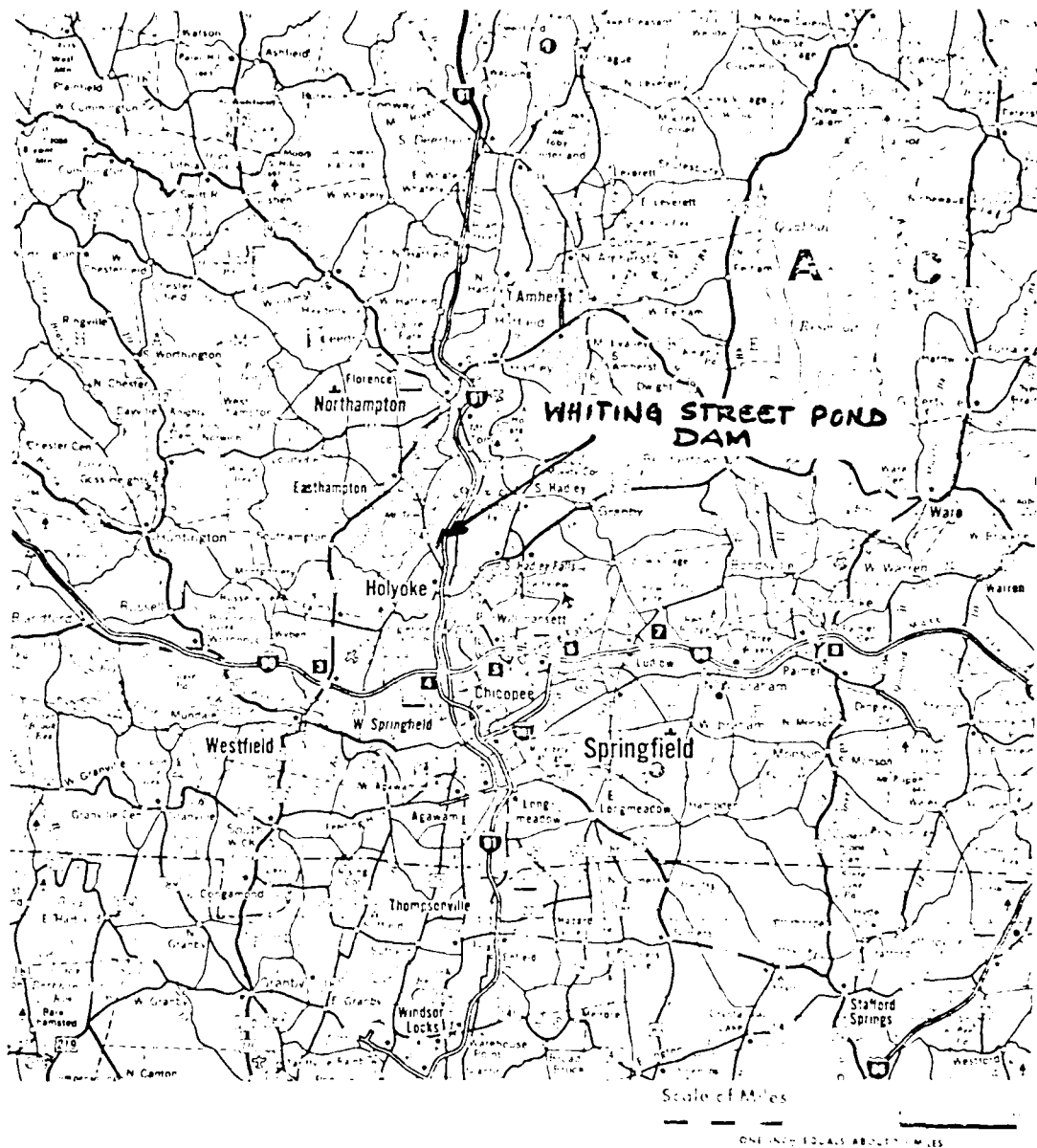
  
Eugene O'Brien, P.E.  
New York No. 29823



1a. UPSTREAM SLOPE LOOKING SOUTH



1b. DOWNSTREAM SLOPE LOOKING NORTH  
OVERVIEW OF DAM



VICINITY MAP  
WHITING STREET POND DAM



V

PHASE I INSPECTION REPORT  
NATIONAL DAM INSPECTION PROGRAM  
CONNECTICUT RIVER BASIN  
INVENTORY NO. MA 00070  
WHITING STREET POND DAM  
CITY OF HOLYOKE  
HAMPDEN COUNTY, COMMONWEALTH OF MASSACHUSETTS

SECTION 1 - PROJECT INFORMATION

1.1 GENERAL

a. Authority

Public Law 92-367, August 8, 1972, authorized the Secretary of the Army, through the Corps of Engineers, to initiate a national program of dam inspection throughout the United States. The New England Division of the Corps of Engineers has been assigned the responsibility of supervising the inspection of the dams within the New England Region. Tippetts-Abbott-McCarthy-Stratton has been retained by the New England Division to inspect and report on selected dams in the State of Massachusetts. Authorization and notice to proceed was issued to Tippetts-Abbott-McCarthy-Stratton under a letter of May 3, 1978, from Mr. Ralph T. Garver, Colonel, Corps of Engineers. Contract No. DACW 33-78-C-0298 has been assigned by the Corps of Engineers for this work.

b. Purpose

- (1) Perform technical inspection and evaluation of non-Federal dams to identify conditions which threaten the public safety and thus permit correction in a timely manner by non-Federal interests.
- (2) Encourage and prepare the States to initiate quickly effective dam safety programs for non-Federal dams.
- (3) To update, verify and complete the National Inventory of Dams.

1.2 DESCRIPTION OF THE PROJECT

a. Description of Dam and Appurtenances

Whiting Street Pond Dam is an earth-buttressed stone masonry dam, 1900 feet long with a maximum height of about 19 feet. The earth buttress is continuous along the downstream side of the stone masonry section. The dam is straight, trending generally north-south except for about 240 feet at the north end, which is "doglegged" to the northwest about 115°. The stone masonry is 7 feet wide at crest level, the earth buttress is 10 feet wide. A

steel guard rail runs along the upstream side of the stone masonry crest.

The upstream slope of the stone masonry section varies from vertical at the foundation to El 367.7 $\pm$ ; 1 (V):0.08 (H) from El 367.7 $\pm$  to El 382.7 $\pm$ ; & 1 (V) : 0.25 (H) from El 382.7 $\pm$  to El 388.7 $\pm$ . The downstream slope of the stone masonry portion of the dam (which is also the upstream face of the earth buttress) varies from vertical at the foundation to El 367.7 $\pm$ ; and 1 (V): 0.25 (H) from El 367.7 $\pm$  to 388.7 $\pm$ . The base width of the stone masonry section is 16 feet. The downstream slope of the earth buttress varies from 1 (V) : 1.25 (H) to 1 (V) : 2.5 (H). According to an available drawing there was to be a "3 inch sheet piling" cutoff wall, 5 feet long, penetrating into a "hard pan" and gravel foundation.

A stone masonry and concrete spillway structure is located about 70 feet from the south abutment. The concrete spillway sill is at two levels; El 387.0 and El 387.45, and is 16.5 and 17 feet long, 8.4 and 7.6 feet wide and 1.7 and 1.25 feet deep, respectively. The sill is notched to accommodate flashboards.

The downstream concrete training walls are 2 feet wide and are about 14 and 18 feet long. There are no upstream training walls.

The concrete lined spillway channel is 33.5 feet wide and narrows to 17 feet, 8.6 feet from the sill. The channel continues under a roadway bridge through three rectangular openings each 5 feet wide. The height of the openings is 1.8, 2.0 and 2.25 feet. The floor of the channel under and adjacent to the bridge is on bedrock. Downstream of the bridge, water discharge over the spillway flows in a natural channel.

A brick gatehouse, above a gate chamber, is located on the crest at approximately the center of the dam. In the upstream wall of, and entering directly into the gate chamber is a 4-foot square sluice way protected by a trash rack. A 10-inch diameter low level outlet pipe has its intake in the gate chamber, runs underground for 375 feet, and outfalls into the spillway channel. A 16-inch diameter pipe, which also starts in the gate chamber, joins the City's water supply system an unknown distance from the dam. A by-pass pipe and connection exists between the low level outlet and the water supply pipe. This connection facilitates repair work to the water supply valve.

Intakes through the 4-foot square sluiceway; the 16-inch supply pipe, the 10-inch low level outlet and the by-pass pipe are regulated by a sluice gate and gate valves, respectively. The operating mechanisms are all manually operated and are located in the gatehouse.

At the point where the low level outlet outfalls, the spillway channel divides into an open concrete-lined rectangular channel and an underground 36-inch diameter concrete pipe. The channel varies from 5 to 10 feet in width and 2 to 6 feet in height (See Photograph). The channel and pipe join at a natural channel in the vicinity of Interstate Highway 91 and then flow into the Connecticut River.

b. Location

The dam is located north of Holyoke, Massachusetts, about one half mile west of the Connecticut River and at the eastern foothills of Mount Tom.

c. Ownership

Whiting Street Pond Dam is owned by the City of Holyoke. The day-to-day operation and maintenance is managed by Holyoke Water Works, Holyoke, Massachusetts.

d. Purpose of Dam

The impoundment provided by the dam is a water storage reservoir for the City of Holyoke.

e. Design and Construction History

Original design and construction records are not available. It is reported that the dam was built about 1900. There are no records of whether the earth buttress section was part of the original construction or was added later.

f. Normal Operating Procedures

Normal water releases from the Whiting Street Pond are to supply the City of Holyoke with approximately 1.2 mgd. There are no other regulated releases.

g. Size Classification

The dam is less than forty feet high but has a maximum storage capacity of more than 1000 acre-feet. It is, therefore, classified as an "intermediate" size dam.

h. Hazard Classification

The dam is in the "high" hazard potential category because in the event of a dam failure substantial property damage with possible loss of life would result. Losses would include; a substantial portion of the City's water supply, a fluoridation and chloridation facility, a portion of Interstate Highway 91 and about 5 one family homes located between Northampton Street and Mountain Park Road.

For details on the selection of the hazard potential category see Section 5.6.

i. Operator

The person responsible for the day-to-day operation of the dam

is:

Mr. Henry Seidel  
Head Filter Plant Operator  
985 Homstead Avenue  
Holyoke, Massachusetts 01040  
Phone: (Home) 413-532-6509  
(Office) 413-442-8992

### 1.3 PERTINENT DATA

#### a. Drainage Area

The Whiting Street Pond is located on a tributary of the Connecticut River between Holyoke and Easthampton. The drainage basin which is located on the eastern slopes of the Mount Tom Range is steep and heavily forested except for the southeast quarter which has some urban development. The basin, which trends in a north-south direction, is approximately 3.2 miles long by 0.5 mile wide with an area of 1.67 square miles. The surface area of the reservoir, at spillway crest (102 acres), is about 10% of the total drainage area.

#### b. Discharges at Damsite

Discharges at the damsite are over an uncontrolled spillway, and through a low level outlet and the City's water supply system.

The concrete spillway sill is at two levels; El 387.0 and El 387.45 and is 16.5 and 17 feet long, 8.4 and 7.6 feet wide and 1.7 and 1.25 feet deep, respectively. The computed maximum discharge, with pond level at El 388.7 (top of dam), is 215 cfs.

The low level outlet is a 10-inch inside diameter cast iron pipe, 375 feet long, with unknown invert elevations at the intake and outlet ends. Maximum discharge through the pipe could not be computed.

There is no record of the maximum flood at the damsite but reportedly the dam has never been overtopped during a major flood.

#### c. Elevation (ft above MSL)

Top of dam	388.7
Maximum pool-design surcharge	Unknown
Maximum pool-test flood surcharge	390.1
Full flood control pool	Not Applicable
Recreation pool	387.0
Spillway crest (gated)	Not Applicable
Upstream portal invert diversion tunnel	Not Applicable
Downstream portal invert diversion tunnel	Not Applicable
Streambed at centerline of dam	Unknown
Maximum tailwater	Unknown

#### d. Reservoir (feet)

Length of maximum pool	3000
Length of recreation pool	3000
Length of flood control pool	Not Applicable

e.	<u>Storage (acre-feet)</u>	
	Recreation pool	2005 (est.)
	Flood control pool	Not Applicable
	Design surcharge	Unknown
	Test flood surcharge	352
	Top of dam	2190
f.	<u>Reservoir Surface (acres)</u>	
	Top of dam	113.5
	Test flood pool	120
	Flood-control pool	Not Applicable
	Recreation pool	102
	Spillway crest	102
g.	<u>Dam</u>	
	Type	Earth buttressed stone masonry
	Length, feet	1900
	Height, feet	19.0
	Top width, feet	17.0
	Side slopes - Upstream	Varies - See Section 1.2a
	Downstream	Varies - See Section 1.2a
	Zoning	Unknown
	Impervious core	Unknown
	Cutoff	5 feet high, 3 inch sheet piling
	Grout curtain	Unknown
	Other	None
h.	<u>Diversion and Regulating Tunnel</u>	
	Type	Not Applicable
	Length	Not Applicable
	Closure	Not Applicable
	Access	Not Applicable
	Regulating facilities	Not Applicable
i.	<u>Spillway</u>	
	Type	Broad-crested, two levels
	Length of weir, feet	33.5
	Crest elevations, feet	387.0 and 387.45
	Gates	None
	Upstream channel	None
	Downstream channel	For description, see Section 1.2a

j. Regulating Outlets

The regulating outlets consist of an uncontrolled spillway, a 16-inch diameter water supply line and 10-inch diameter low level outlet.

The concrete spillway sill is at two levels: El 387.0 and El 387.45 and is 16.5 and 17 feet long, 8.4 and 7.6 feet wide and 1.7 and 1.25 feet deep, respectively.

The water supply line is of unknown length, and the invert elevations of the 375-foot long low level outlet pipe, are also unknown. Discharges through the pipes are controlled by manually operated gate valves which are operable. The water supply line is operated as required to satisfy water supply demand. The low level outlet is reportedly operated only occasionally.



## SECTION 2 - ENGINEERING DATA

### 2.1 DESIGN

Design data and specific memoranda are not available for the original construction of the dam. Two drawings were obtained from the owner; they show the cross section and centerline profile of the masonry portion of the dam. (See Appendix). One of the drawings shows a plan of a "waste way" which is not in accordance with the existing conditions. There are no drawings showing the earth buttress section.

The elevations shown in these drawings do not correspond to those shown on the USGS quadrangle sheet. All elevations referred to in this report are based on the reservoir level shown on the USGS sheet which is assumed to be the elevation of the spillway sill. Sketches of the dam and spillway, plans and sections were prepared on the basis of approximate field measurements made at the time of this visual inspection. (See Appendix).

There is no information available on subsurface conditions other than the reference to "hard pan" and gravel noted on one of the drawings.

### 2.2 CONSTRUCTION RECORDS

There are no construction records available.

### 2.3 OPERATION RECORDS

The operation of the sluice gate, low level and water supply system gate valves are recorded; readings of the pond level and rainfall are taken on a regular basis. These records are kept in the offices of the Holyoke Water Works, Holyoke, Massachusetts.

### 2.4 EVALUATION OF DATA

#### a. Availability

Existing information was made available by Holyoke Water Works, Holyoke, Massachusetts.

#### b. Adequacy

The lack of in-depth engineering data did not allow for a definitive review. Therefore the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

c. Validity

In general, the information obtained from the available drawings, with above noted exceptions, and personal interviews is consistent with observations made during the inspection and therefore considered reliable.

## SECTION 3 - VISUAL INSPECTION

### 3.1 FINDINGS

#### a. General

A visual inspection of Whiting Street Pond Dam was made on 2 August 1978. The weather was cloudy, temperature between 70° and 75°F. The last rainfall, a heavy thunderstorm, occurred early that morning. At the time of inspection, the lake level was about 1.9 feet (El 385.1<sup>±</sup>) below spillway crest.

#### b. Dam

The dam appears to be in generally good condition. The horizontal and vertical alignment of the crest are good. The stone and grass surface at the crest are in good condition, however, at several locations there are saplings growing between the stone masonry joints (See Photograph No. 3). No longitudinal or transverse surface cracks were observed.

The downstream slope is completely covered with heavy ground cover, seedlings and shrubs and does not show any erosion, sloughing or signs of trespassing (See Photograph No. 2). It is reported that this slope has not been mowed for the past two years, but that the slope will be mowed later in the summer.

The upstream slope, which is stone masonry and almost vertical, appears above the water line to be in good condition, there are, however, a few missing stones at several locations and much of the mortar pointing is loose and/or missing (See Photograph No. 14). There is some vegetation growing through the open masonry joints.

There is evidence of seepage along the lower portion of the downstream face and toe of the embankment. A wet area apparently caused by seepage, is located between 420 and 640 feet north of the spillway and about 20 feet below the crest. The quantity of seepage could not be determined because of the heavy ground cover and vegetation. At about the same elevation and about 640 feet north of the spillway there is another wet area which extends 290 feet to the north. It was not possible, to determine whether this wet area is caused by seepage or surface runoff from the previous night's rain. (See Photograph No. 13).

A 14-inch diameter cast iron pipe outlet is located about 110 feet north of the spillway at the downstream toe of the dam. The pipe, which was not flowing, terminates at the spillway channel. The purpose, extent, limit and the location of the operating controls for the pipe are unknown. (See Photograph No. 12).

c. Appurtenant Structures

The stone masonry and concrete spillway is in generally good condition with some minor spalling at both crest levels. There is minor seepage at and above the contact of the downstream face of the spillway weir and floor. The concrete floor of the discharge channel, upstream of the bridge openings, is superficially spalled. There is vegetation growing and a leakage of about 5 gpm at the contact between the concrete spillway and the downstream wall of the north opening under the bridge. There is minor spalling of all training walls. (See Photograph Nos. 4 & 5).

d. Abutments

There were no signs of seepage or other unusual conditions at the abutments.

e. Downstream Channel

There is effectively only one downstream channel, the spillway channel. The natural portions of the channel are overgrown with heavy vegetation, there are overhanging trees and there is minor debris in the channel. At the time of inspection, flows in the channel did not appear to be impeded. The openings below the bridge, immediately downstream of the spillway, were clear and do not appear to restrict spillway discharges. The concrete lined portions of the channel are in poor condition with severe spalling and erosion along the base of most of the walls and there are two locations (about 400 feet downstream from the toe) where boils were noted flowing from holes in the concrete floor of the channel (See Photograph Nos 6-9).

f. Reservoir Area

In the vicinity of the dam, there is no evidence of sloughing, potentially unstable slopes or other unusual conditions which would adversely affect the dam.

3.2 EVALUATION OF OBSERVATIONS

Visual observations made during the course of the investigation revealed several deficiencies which at present do not adversely affect the adequacy of the dam. However, these deficiencies do require attention and should be corrected before further deterioration leads to a hazardous condition. Recommended measures to improve these conditions are given in Section 7.

## SECTION 4 - OPERATION AND MAINTENANCE PROCEDURE

### 4.1 PROCEDURES

Operational procedures for the project are not formally established but are based on the experience of the operating personnel.

### 4.2 MAINTENANCE OF DAM

There is no formal maintenance manual for the project. Maintenance is carried out as needed. The mowing of grass and the cutting of vegetation is done as required and when time allows. There is no scheduled program of inspection by the Water Works personnel, however it is reported, there is a statewide program by the Department of Environmental Quality Engineering, Division of Waterways, Boston, Massachusetts.

### 4.3 MAINTENANCE OF OPERATING FACILITIES

There is no established maintenance program for the operating facilities. Maintenance is carried out as needed.

### 4.4 WARNING SYSTEM IN EFFECT

There is no warning system in effect nor one planned.

### 4.5 EVALUATION

The maintenance and operating procedures for the dam and appurtenant structures are considered inadequate. Measures to improve these deficiencies are given in Section 7.

## SECTION 5 - HYDRAULIC/HYDROLOGIC

### 5.1 DRAINAGE BASIN CHARACTERISTICS

The Whiting Street Pond is located on a tributary of the Connecticut River between Holyoke and Easthampton. The drainage basin which is located on the eastern slopes of the Mount Tom Range is steep and heavily forested, except for the southeast quarter which has some urban development. The basin, which trends in a north-south direction, is approximately 3.2 miles long, 0.5 mile wide, with an area of 1.67 square miles. The surface area of the reservoir, at spillway crest (102 acres), is about 10% of the total drainage area.

### 5.2 SPILLWAY CAPACITY

The spillway of the Whiting Street Pond Dam is 33.5 feet in length and approximately 7.5 feet wide. The northern half of the spillway crest is 1.70 feet below the top of the dam, (El 387), while the other half is 0.45 feet higher (El 387.45). The maximum computed capacity of the spillway is 215 cfs with water level at the top of the dam (El 388.7) and is not restricted by the openings under the bridge located directly downstream.

### 5.3 RESERVOIR CAPACITY

The maximum capacity of the Whiting Street Pond is 2,190 acre-feet. It is estimated that the surcharge storage, between the spillway crest and the top of the dam is 185 acre-feet, which is equivalent to a depth of about 2.0 inches of runoff over the entire basin.

### 5.4 FLOODS OF RECORD

There are no records of flow from this small drainage area. However rainfall records of the hurricane floods of September 1938 at the dam site indicate that 10.53 inches of rain fell during the period 18-22 September inclusive, with 4.23 inches on September 21.<sup>1</sup>

### 5.5 DESIGN FLOOD

Because there are no data on Probable Maximum Floods for an area of 1.67 square miles it was necessary to synthesize a test flood hydrograph for the contributing area. Initially, a depth-duration relation for Probable Maximum Point rainfall for durations from 6 hours to 24 hours was taken from Weather Bureau Sources.<sup>2</sup> The distribution of the rainfall was

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<sup>1</sup>/ Hurricane Floods of September 1938, U.S. Geological Surveys W.S.P. #867, 1940.

<sup>2</sup>/ Seasonal Variation of the Probable Maximum Precipitation East of the 105 Meridian for Areas from 10 to 1,000 Square Miles and Durations of 6, 12, 24 and 48 hours. Hydrometeorological Report No. 33, 1956.

based on data in a publication of the World Meteorological Organization.<sup>3/</sup> Increments of depths from the depth duration relation, at 15 minute intervals, were arranged in the probable storm sequence as shown in the Appendix. The synthesized Probable Maximum Flood peak inflow discharge is 9029 cfs.

#### 5.6 OVERTOPPING POTENTIAL

The adequacy of the Whiting Street Dam Spillway was tested by routing the Probable Maximum Flood, through the reservoir, using a computerized technique. The water level was assumed to be at El 387 (spillway crest elevation) at the start of the flood inflow. The routed flood raised the surface elevation of the reservoir 3.1 feet to an elevation of 390.1 (1.4 feet above the top of the dam). The peak outflow discharge was 8253 cfs, about 38 times the spillway capacity.

In order to estimate the downstream dam failure hydrograph, the U.S. Corps of Engineers "Rule of Thumb" guidance was used. The estimate assumes: (a) the reservoir surface is at the top of the dam at the time of the breach, (b) a breach of 40% of the dam length occurs (760 feet) and (c) the channel has an average roughness coefficient (n) of 0.07. It is estimated that at a selected section, 1700 feet downstream of the dam, the peak flood wave discharge is 93,310 cfs with a wave height of about 14 feet. The visual inspection revealed the existence of about 5 one family homes which are not shown on the U.S.G.S. Quadrangle sheet for Mount Tom, Mass. at or below about El 300. These houses would probably be destroyed or damaged by the estimated flood wave. In addition failure of the dam would destroy a substantial portion of the City's water supply, a fluoridation & chlorination facility and a portion of Interstate Highway 91.

#### 5.7 EVALUATION

The spillway of the Whiting Street Pond Dam, with a computed capacity of 215 cfs, (which is 2.6% of the test flood outflow) cannot pass the estimated Probable Maximum Flood, and therefore is considered to be inadequate from a hydraulic and hydrologic standpoint.

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<sup>3/</sup> Manual for Estimation of Probable Maximum Precipitation, World Meteorological Organization, Operational Hydrology Report No. 1973.

## SECTION 6 - STRUCTURAL STABILITY

### 6.1 EVALUATION OF STRUCTURAL STABILITY

#### a. Visual Observations

Visual observations did not indicate any serious structural problems with the embankment, spillway, sluice gate, water supply line or low level outlet. The deficiencies described in Section 3 require attention and measures to improve these deficiencies are given in Section 7.

#### b. Design and Construction Data

No design computations or other data pertaining to the structural stability of the dam have been located.

On the basis of the performance experience, the visual inspection, as well as engineering judgment, the dam at present appears to be structurally adequate.

#### c. Operating Records

There are operating records available at the offices of the Holyoke Water Works, Holyoke, Massachusetts. There are no records or reports of operational problems which would affect the stability of the dam.

#### d. Post-Construction Changes

It is reported that the dam was built around 1900. There are no records of any construction changes even though the present dam, which includes an earth buttress section, varies from the sections shown in the drawings. (See Appendix).

#### e. Seismic Stability

The dam is located in Seismic Zone 2 and in accordance with recommended Phase I guidelines does not warrant seismic analysis.



## SECTION 7 - ASSESSMENT, RECOMMENDATIONS & REMEDIAL MEASURES

### 7.1 DAM ASSESSMENT

#### a. Condition

Phase I investigation of Whiting Street Pond Dam does not indicate conditions which would constitute an immediate hazard to human life or property. Based on engineering judgement and the performance of the dam and the outlet works, the project appears to be in fair condition. The project, however, does have inadequacies and deficiencies which, if not remedied, have the potential for developing into hazardous conditions.

Because there are no data on Probable Maximum Floods for an area of 1.67 square miles, it was necessary to synthesize a test flood hydrograph for the contributing area. Increments of depths from a depth duration relation, at 15 minute intervals, were arranged in the probable storm sequence. The synthesized Probable Maximum Flood (PMF) peak inflow discharge was 9029 cfs.

The adequacy of the Whiting Street Pond Dam spillway was tested by routing the Probable Maximum Flood through the reservoir, using a computerized technique. The water level was assumed to be at the spillway crest elevation at the start of the flood inflow. The routed flood raised the surface elevation of the reservoir 3.1 feet or 1.4 feet above the top of the dam. The peak outflow discharge was 8253 cfs, about 38 times the spillway capacity. Since the spillway of the Whiting Street Pond Dam, with a computed capacity of 215 cfs, cannot pass the estimated Probable Maximum Flood, it is considered to be very inadequate from a hydraulic and hydrologic standpoint. Furthermore, as a result of the anticipated overtopping it is questionable whether the earth buttress portion of the dam could withstand the overtopping and whether the stone masonry portion could stand without the buttress.

#### b. Adequacy of Information

The lack of in-depth engineering data did not allow for a definitive review. Therefore the adequacy of this dam could not be assessed from the standpoint of reviewing design and construction data, but is based primarily on visual inspection, past performance history and sound engineering judgment.

#### c. Urgency

The recommendations and remedial measures described in subsequent paragraphs should be undertaken by the owner within 12 months after receipt of this Phase I Inspection Report.

#### d. Need for Additional Investigations

Additional investigations to assess the adequacy of the dam and appurtenant structures do appear necessary and are enumerated in the following paragraph.

## 7.2 RECOMMENDATIONS

It is recommended that the following measures be undertaken by the owner within 12 months after receipt of this Phase I Inspection Report.

1) A competent consulting engineer should be retained to conduct further detailed hydraulic studies to determine what measures are necessary to improve discharge capacities.

2) To prevent possible overtopping in the period before receipt of the detailed hydraulic report, the reservoir should be maintained at a lower level to provide additional flood surcharge storage. The level should be lowered about 2 to 3 feet and a monthly elevation rule curve should be established.

## 7.3 REMEDIAL MEASURES

### a. Alternatives

The results of the additional investigations recommended above may indicate alternatives which will be needed to provide discharge adequacy under flood conditions. These alternatives can only be determined after completion and evaluation of the additional investigations.

### b. Operating and Maintenance Procedures

*It is recommended that the following measures be undertaken by the owner within 24 months after receipt of this Phase I Inspection Report.*

1. Establish a systematic program of observation and monitoring of changes in pattern and quantity of seepage. Observations can be accomplished by the installation of piezometers.
2. Establish a formal program of operation and maintenance to include periodic inspections on a bi-annual basis.
3. Round the clock surveillance should be provided by the owner during periods of unusually heavy precipitation.
4. The owner should develop a formal warning system with local officials for alerting downstream residents in case of emergency.
5. The missing stones in the masonry portion of the dam should be replaced and all joints repointed.
6. Debris and overhanging trees should be removed and hauled away from the downstream channels.
7. Vegetation growing from the joints in the stone masonry should be removed.
8. Vegetation on the downstream slope and area adjacent to downstream toe should be cut regularly.
9. Concrete walls and floor of downstream channel should be repaired.

VISUAL INSPECTION CHECKLIST

APPENDIX A

VISUAL INSPECTION CHECK LIST  
PARTY ORGANIZATION

PROJECT WHITING STREET POND DAM DATE 8-5-78

TIME 11.00 AM

WEATHER Overcast 75°-80°

W.S. ELEV. 387.0 \*

PARTY:

- |                             |           |
|-----------------------------|-----------|
| 1. <u>Harvey S Feldman</u>  | 6. _____  |
| 2. <u>Jyotindra H Patel</u> | 7. _____  |
| 3. _____                    | 8. _____  |
| 4. _____                    | 9. _____  |
| 5. _____                    | 10. _____ |

PROJECT FEATURE	INSPECTED BY	REMARKS
1. <u>All project features are inspected by above party members</u>		
2. _____		
3. _____		
4. _____		
5. _____		
6. _____		
7. _____		
8. _____		
9. _____		
10. _____		

\* Lake level taken from 11:45 topographic sheet which indicates EL. 387.0. It is assumed that this elevation is also spillway s.l.

# PERIODIC INSPECTION CHECK LIST

PROJECT WHITING STREET POND DAM DATE 8-4-78  
 PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_  
 DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

## DAM EMBANKMENT

Crest Elevation 388.7 [1.7 ft above spillway sill]  
 Current Pool Elevation 387.0 (See Note on front page of check list)  
 Maximum Impoundment to Date Unknown  
 Surface Cracks None visible  
 Pavement Condition No pavement  
 Movement or Settlement of Crest None observed  
 Lateral Movement None observed  
 Vertical Alignment Generally good  
 Horizontal Alignment Generally good  
 Condition at Abutment and at Concrete Structures Generally good  
 Indications of Movement of Structural Items on Slopes None observed  
 Trespassing on Slopes None  
 Sloughing or Erosion of Slopes or Abutments None  
 Rock Slope Protection - Riprap Failures No riprap - Stone masonry up slope  
See comments regarding stone  
 Unusual Movement or Cracking at or near Toes None observed

Unusual Embankment or Downstream Seepage Two wet areas at lower part of the downstream face and toe of the embankment. One is located 400 to 640 feet north of the spillway and about 20 feet below crest. The amount of seepage could not be determined because of heavy ground cover and vegetation. At about same elevation and about 640 feet north of the wall the area extends 290 ft. to the North. It was not possible to determine if seepage is surface

Piping or Boils None

Foundation Drainage Features None

Toe Drains None

Instrumentation System None

Miscellaneous At crest, the stone and grass surface are in good condition, however there are several areas where saplings growing between the stone masonry joints.

The downstream slope is completely covered with heavy ground cover, seedlings and shrubs. It is reported that this slope has not been mowed for the past two years, but that the slope will be mowed later in summer.

The upstream slope appears above water line in good condition, however there are a few missing stones at several locations and much of the mortar pointing is loose and or missing. Also some vegetation growing through the open masonry joints.

PERIODIC INSPECTION CHECK LIST

PROJECT WHITING STREET POND DAM DATE 8-2-78

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

OUTLET WORKS - INTAKE CHANNEL AND  
INTAKE STRUCTURE

*There is no intake channel  
and intake structure. The gate chamber  
has a 4 ft square sluiceway  
opening protected by trash rack.  
Could not observe condition, submerged.*

a. Approach Channel

Slope Conditions \_\_\_\_\_

Bottom Conditions \_\_\_\_\_

Rock Slides or Falls \_\_\_\_\_

Log Boom \_\_\_\_\_

Debris \_\_\_\_\_

Condition of Concrete Lining \_\_\_\_\_

Drains or Weep Holes \_\_\_\_\_

b. Intake Structure

Condition of Concrete \_\_\_\_\_

Stop Logs and Slots \_\_\_\_\_

# PERIODIC INSPECTION CHECK LIST

PROJECT WHITING STREET POND DAM DATE 8-2-78

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

## OUTLET WORKS - CONTROL TOWER

Brick,  
a. Concrete and Structural

~~General Condition~~

~~General Condition &  
Condition of Joints~~

~~Condition of joints~~

Spalling

Visible Reinforcing

Rusting or Staining of Concrete

Any Seepage or Efflorescence

Joint Alignment

Unusual Seepage or Leaks in Gate Chamber

Cracks

Rusting or Corrosion of Steel

b. Mechanical and Electrical

Air Vents

Float Wells

Crane Hoist

Elevator

The gate house located at crest, approx. middle of dam, is of brick. Also under house is a gate chamber, full of water. Controls for water supply system and low level outlet are located in the gate house

Gate house general condition and  
are good Gate chamber submerged in water

None in Gate house

None in Gate house

None in Gate house

None in Gate house; Gate  
chamber submerged in water

None in Gate house

None in Gate house

None

None

None

None



Hydraulic System None

Service Gates See Misc

Emergency Gates \_\_\_\_\_

Lightning Protection System None

Emergency Power System None

Wiring and Lighting System None

Misc: operating controls for sluiceway, low level outlet, water supply line and by-pass valve are in good condition.

# PERIODIC INSPECTION CHECK LIST

PROJECT WHITING STREET POND DAM DATE 8-2-78

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

OUTLET WORKS - TRANSITION AND CONDUIT

*Outlet low level outlet and water supply pipe lines are located in gate chamber.*

General Condition of Concrete No Concrete (See Comments below)

Rust or Staining of Concrete \_\_\_\_\_

Spalling \_\_\_\_\_

Erosion or Cavitation \_\_\_\_\_

Cracking \_\_\_\_\_

Alignment of Monoliths \_\_\_\_\_

Alignment of Joints \_\_\_\_\_

Numbering of Monoliths \_\_\_\_\_

*low level Outlet pipe and water supply pipe lines are underground therefore not inspected. However low level outlet where it empties into the spillway, is in good condition*

*Also there is a 14-inch diameter cast iron pipe located about 110 feet north of the spillway at downstream toe of dam. The pipe, which was not flowing, terminates at the spillway channel. The purpose, location limit and the location of the opening or hole for the pipe are unknown.*

PERIODIC INSPECTION CHECK LIST

PROJECT WHITING STREET POND DAM DATE 8-2-78

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

OUTLET WORKS - OUTLET STRUCTURE AND  
OUTLET CHANNEL

*There is effectively only one  
downstream channel, the Spillway  
channel. (See Abutment Discharge  
channel comment)*

General Condition of Concrete \_\_\_\_\_

Rust or Staining \_\_\_\_\_

Spalling \_\_\_\_\_

Erosion or Cavitation \_\_\_\_\_

Visible Reinforcing \_\_\_\_\_

Any Seepage or Efflorescence \_\_\_\_\_

Condition at Joints \_\_\_\_\_

Drain Holes \_\_\_\_\_

Channel \_\_\_\_\_

Loose Rock or Trees Overhanging Channel \_\_\_\_\_

Condition of Discharge Channel \_\_\_\_\_

# PERIODIC INSPECTION CHECK LIST

PROJECT WHITING STREET POND DAM DATE 8-2-78

PROJECT FEATURE \_\_\_\_\_ NAME \_\_\_\_\_

DISCIPLINE \_\_\_\_\_ NAME \_\_\_\_\_

## OUTLET WORKS - SPILLWAY WEIR, APPROACH AND DISCHARGE CHANNELS

### a. Approach Channel None

General Condition \_\_\_\_\_

Loose Rock Overhanging Channel \_\_\_\_\_

Trees Overhanging Channel \_\_\_\_\_

Floor of Approach Channel \_\_\_\_\_

### b. Weir and Training Walls Stone Masonry &

General Condition of Concrete Weir & Training walls are in good condition

Rust or Staining None

Spalling minor spalling at crest levels of spillway and training walls

Any Visible Reinforcing None observed

Any Seepage or Efflorescence Minor seepage at and above crest of downstream face of weir and floor

Drain Holes None

### c. Discharge Channel

General Condition Fair to poor

Loose Rock Overhanging Channel None observed

Trees Overhanging Channel there are trees overhanging channel with some fallen trees in channel

Floor of Channel Concrete floor of channel is poor condition  
with severe spalling and erosion along the base of  
most of the retaining walls. (see misc. comments.)

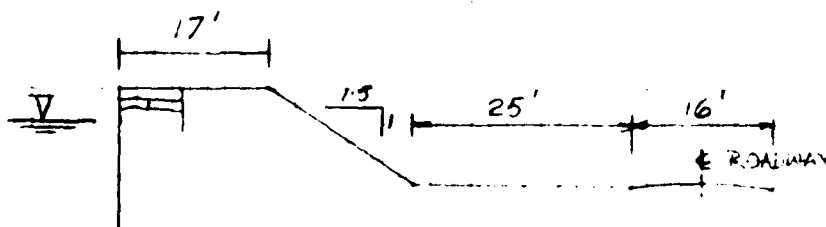
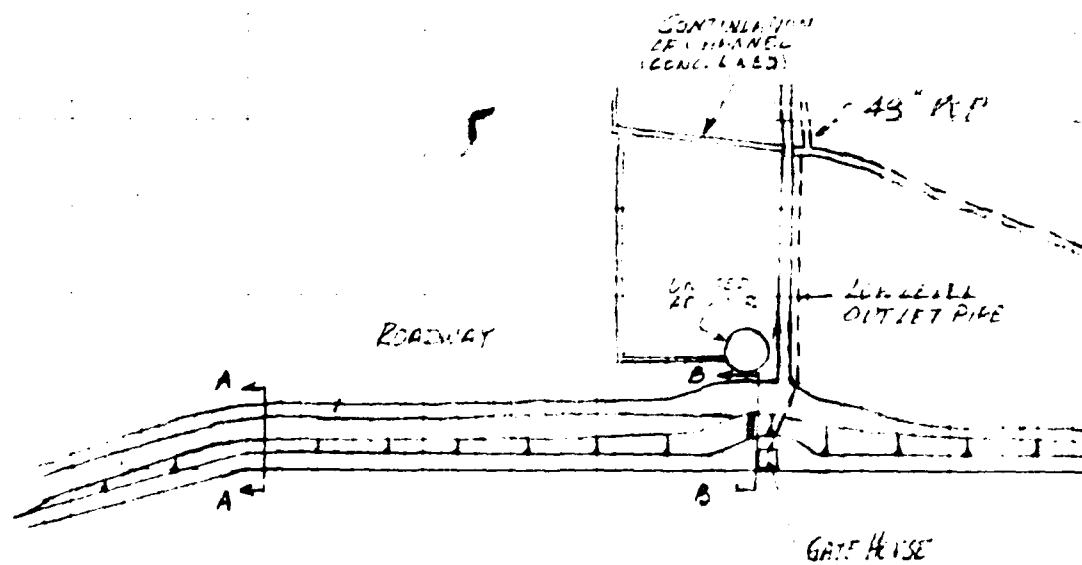
Other Obstructions There is minor debris and  
natural portions of the channel are overgrown with  
heavy vegetation, but does not impede flow in  
the channel.

Miscellaneous. There was no water flowing over  
the spillway

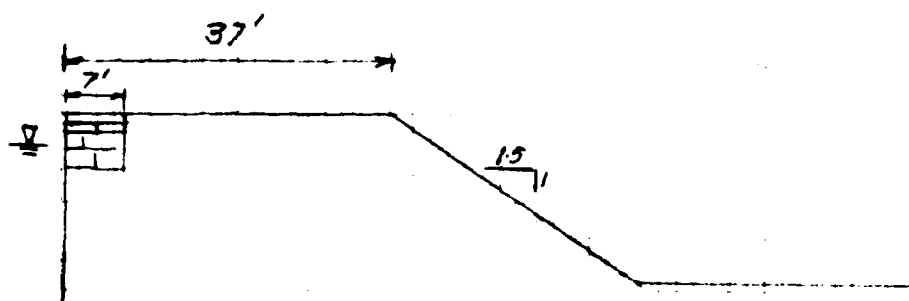
The concrete floor of discharge  
channel, upstream of the bridge opening is  
superficially spalled. There is vegetation growing  
and a leakage of about 5 gpm at the  
contact between the concrete spillway floor  
downstream wall of the north opening under  
the bridge

DRAWINGS

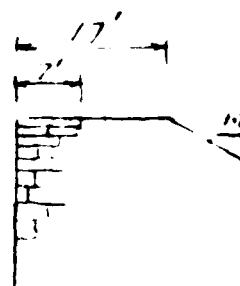
APPENDIX B



SECTION A-A



SECTION B-B



SECTION

NOTE: DRAWING BASED ON ROUGH FIELD MEASUREMENTS  
MADE DURING VISUAL INSPECTION

18" R.P.

WALL  
TILET PIPE

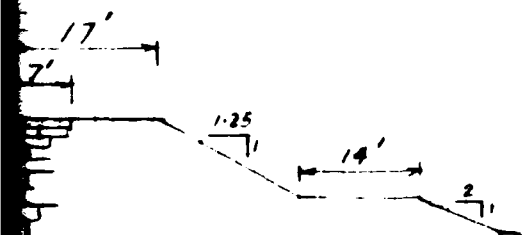
DEPRESSURED SINKING  
CHANNEL

N

2' MIN. DITCH 4' BEECH  
2' MIN.

HOUSE

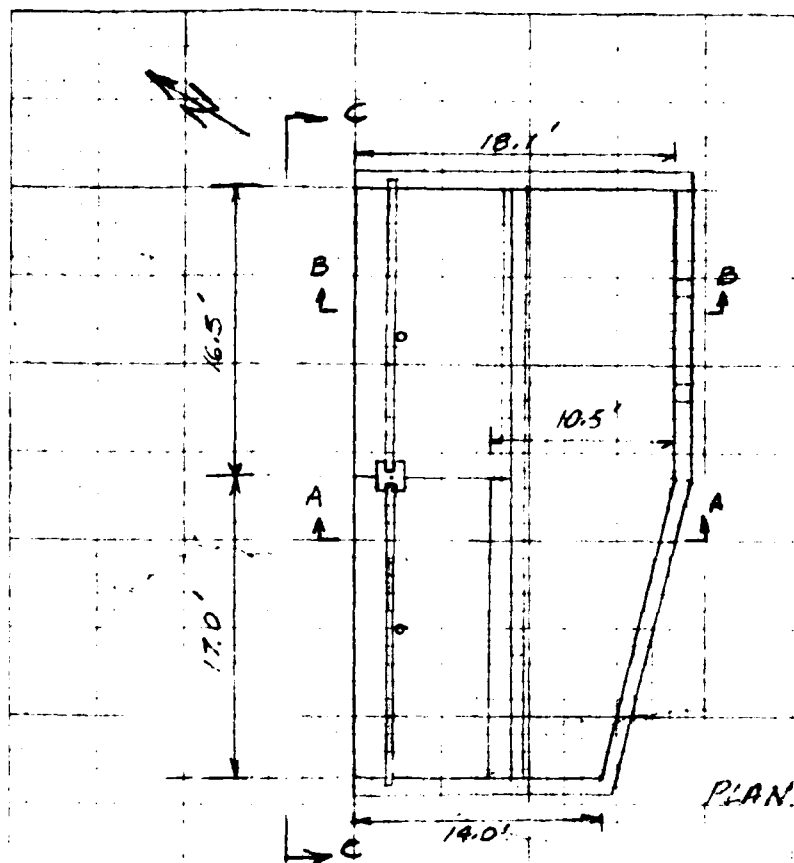
WHITING STREET



SECTION C-C

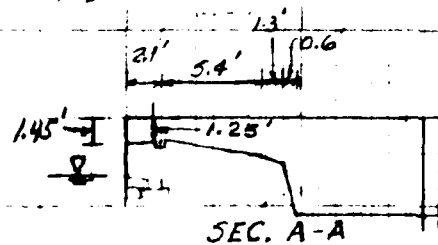
TAMS	MASS	NEW ENGL. CIV. ENGRS. AND SURVEYORS ASSOCIATION BOSTON, MASS.
BLOCKING		
NATIONAL ACADEMY OF SCIENCES OF NON-FERROUS WHITING STREET FUND		
PLAN AND SECTION		
CONNECTICUT RIVER BASIN	MASS	
		DATE: 4/6/79



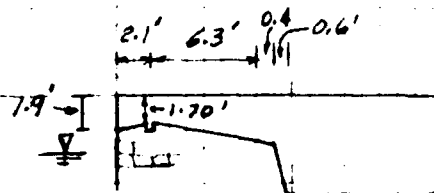


NOTE: DRAWING BASED ON  
ROUGH FIELD MEASUREMENTS  
MADE DURING VISUAL  
INSPECTION

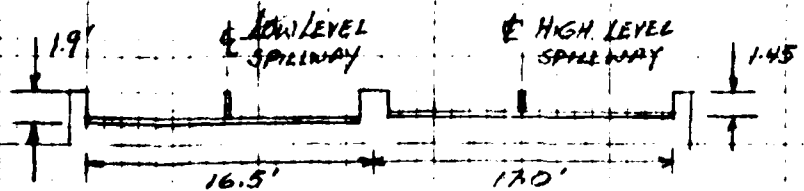
PLAN



SEC. A-A



SEC. B-B



SEC. C-C

THATIS BROOKLINE	MASS.	U.S. ARMY ENGINEER CENTER CORPS OF ENGINEERS WATERWAYS DIVISION
NATURAL SCIENCE OF RESECTION OF THE FID 2005		
KIMBERLY STREET POND		
SPILLWAY - PLAN AND SECTIONS		
CONSTRUCTION DRAWING		
SCALE: 1" = 10'		
DATE: DEC. 30		

Hampshire as

The foregoing is a true copy  
of the Writing Street Brook Dam  
sent with the County Commission

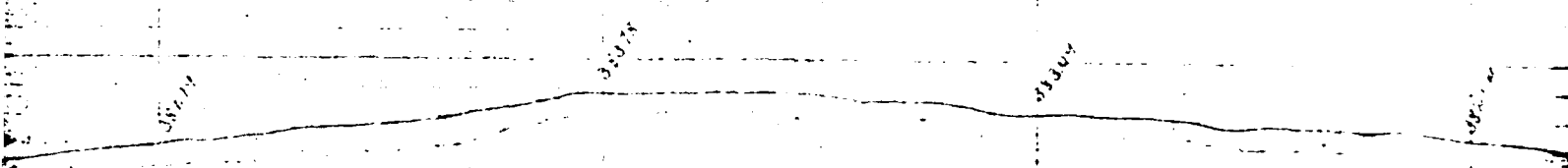
July 25. 1838

Witness my hand this 25th day of

W. H. Clap

Profile of Stone Dam  
for  
Reservoir at Whiting Street  
Holyoke Mass.

July 1888. for Holyoke



as  
going is a true copy of the plan  
Street Brook Dam Reservoir  
County Commissioners on

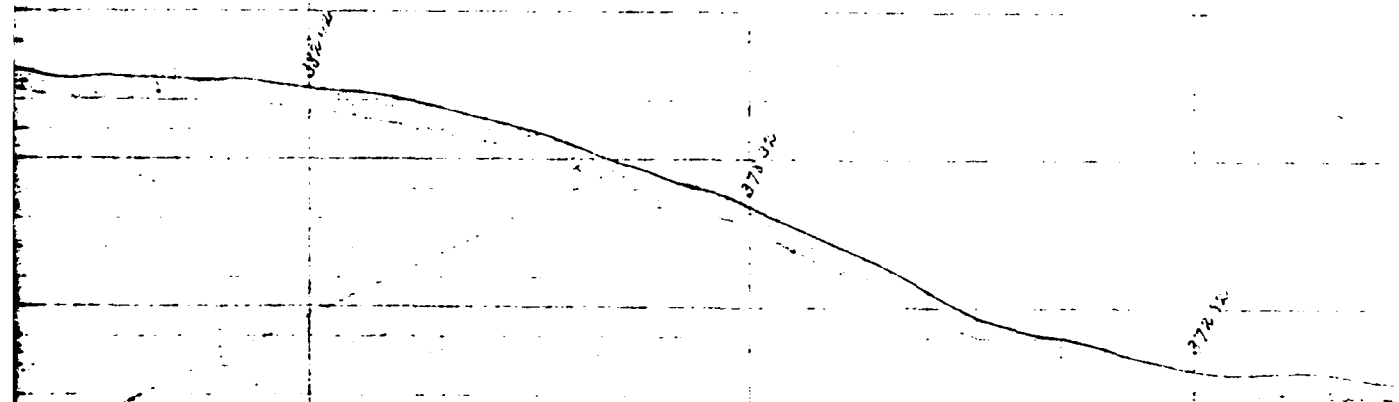
rephased this plan, Oct 1892

W. H. Clapp Clerk.  
2

of Stone Dam  
for  
Whiting Street Brook  
Holyoke Mass.

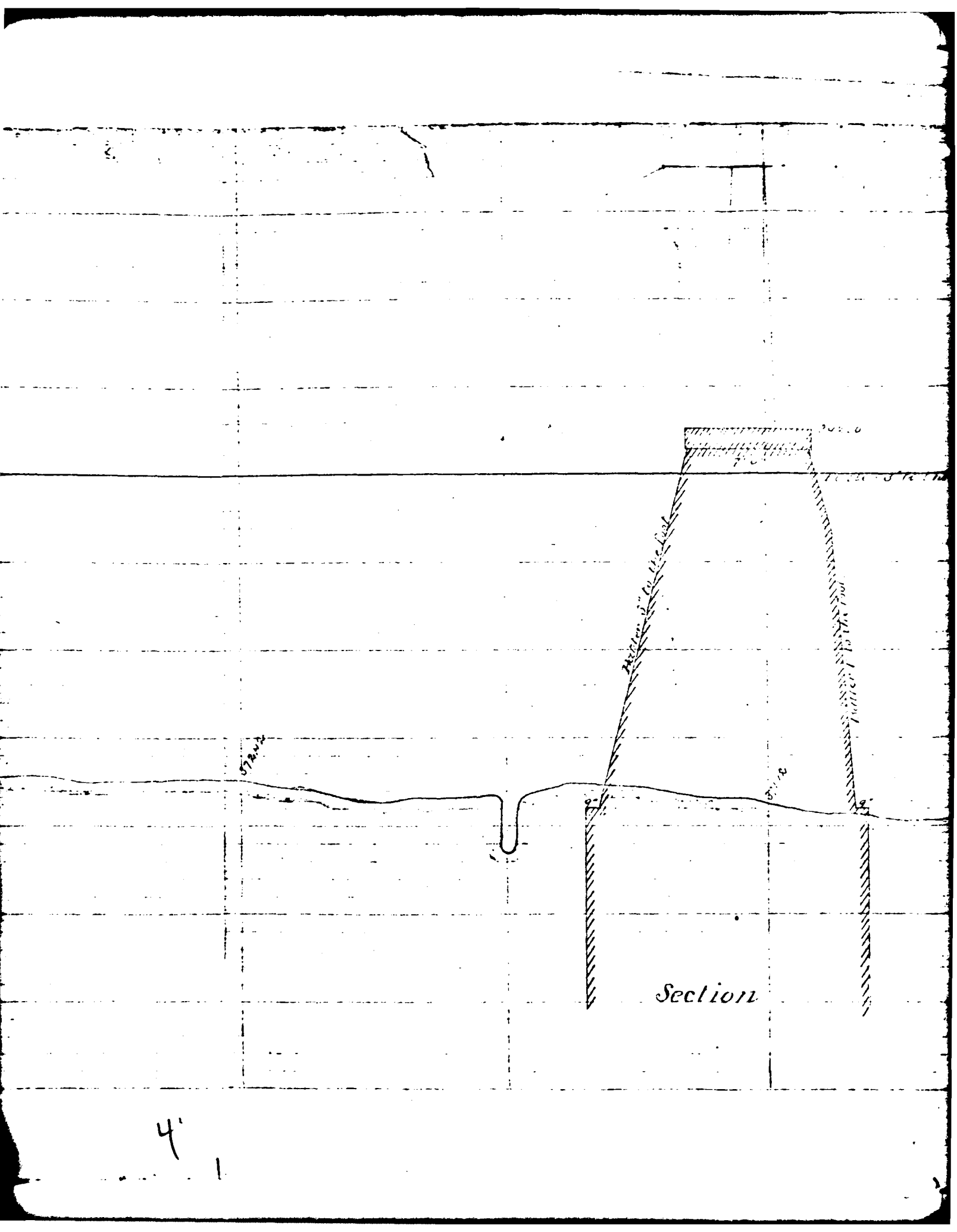
for Holyoke Water Works.

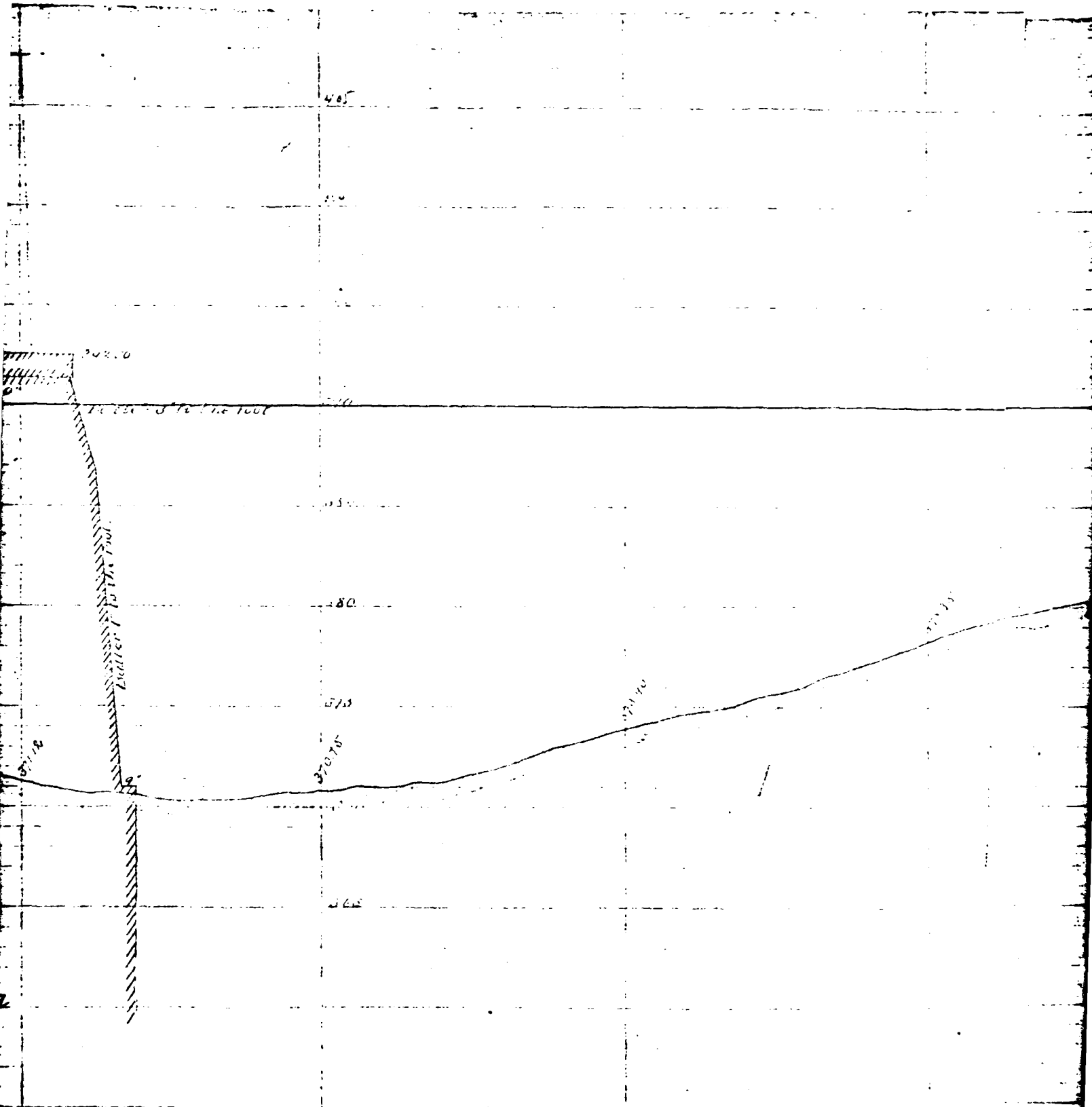
Water Line Elev. 370



STANDARD PROFILE PAPER  
NO 84 \* B A 4 X 30

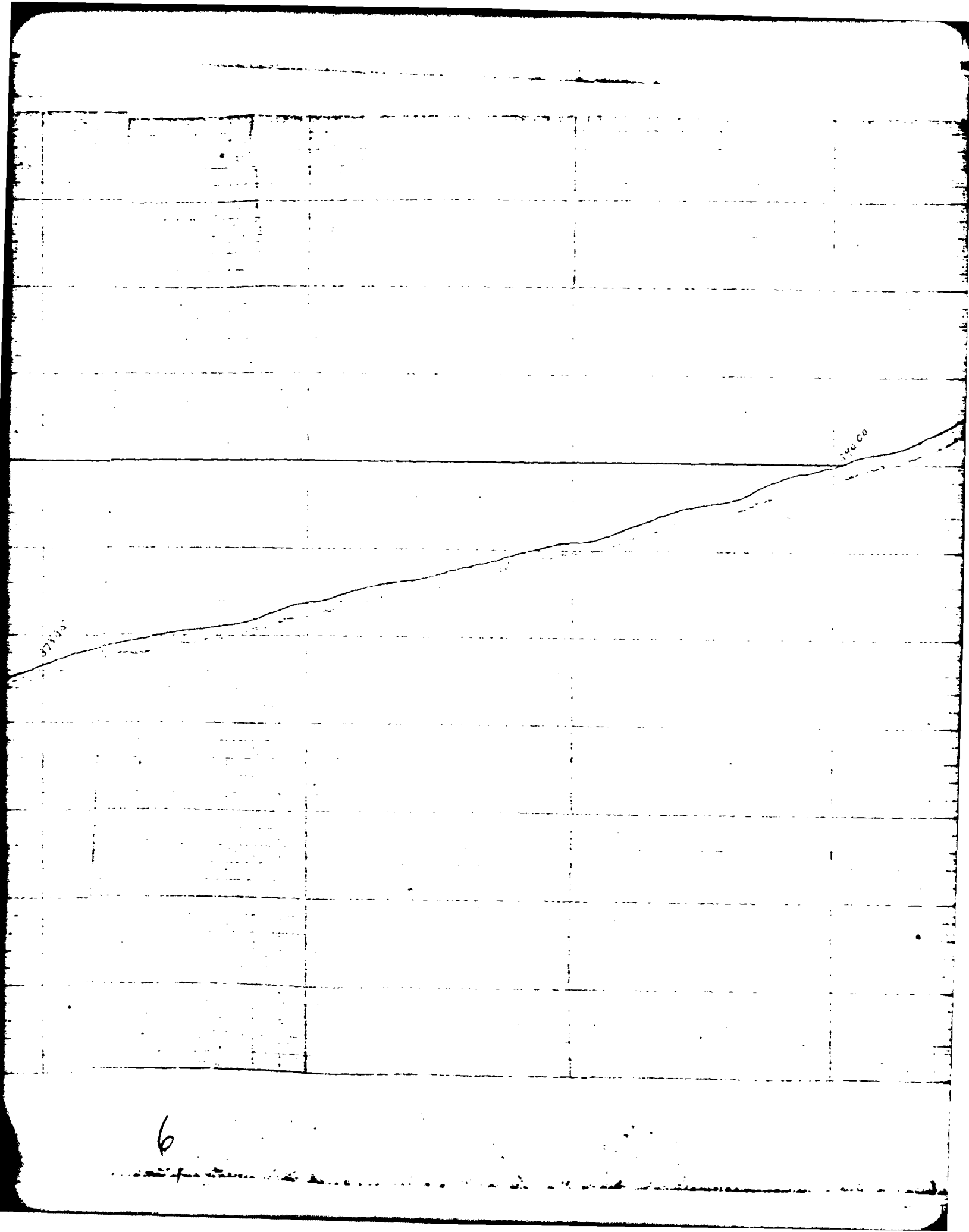
3





STANDARD PROFILE PAPER  
No. 8 • B • 4130

5



6

*Plan of*

St

*Top of Dam*

*Cattle house Wall.*

*Water 8 ft*

340.00

STANDARD PROFILE PAPER  
No 64 • B • 4x30

7



# *Plan of Waste Ditch Walls*

*Scale 1/4 in. = 1 ft.*

*of Ditch*

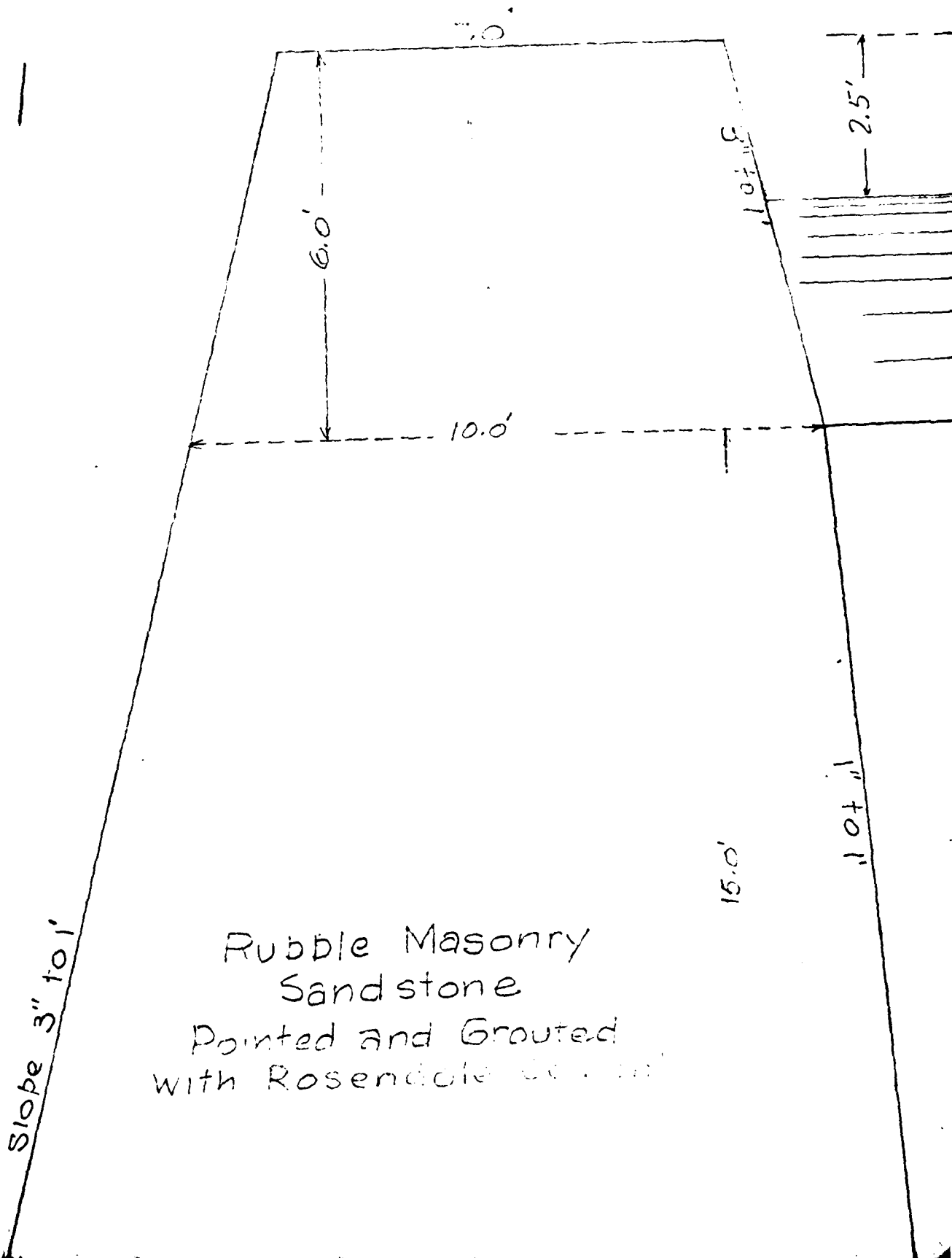
*Waste Ditch 20' wide*

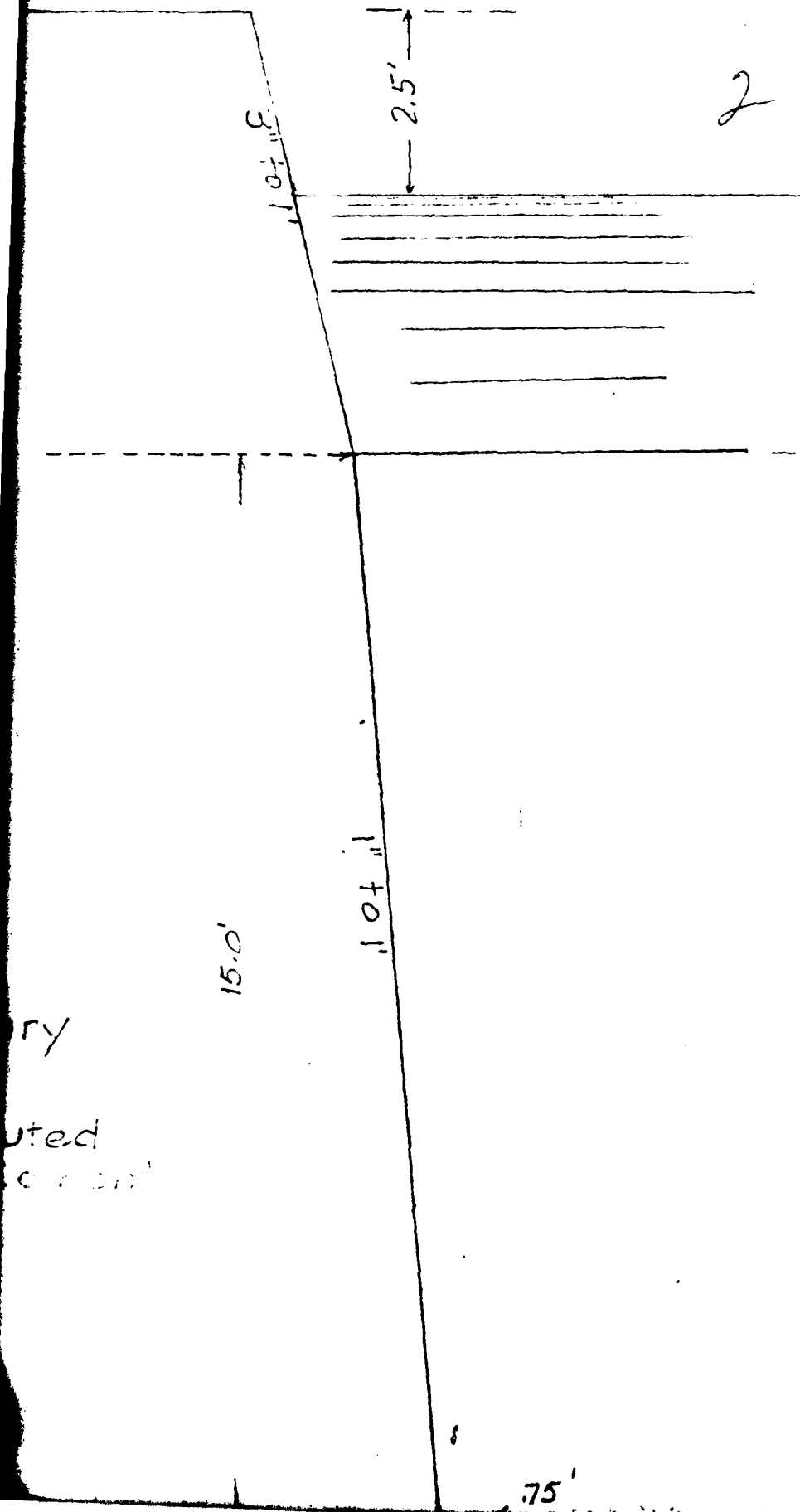
*Cute house Ditch*

*Outlet pipe*

*This space to be covered with  
fluggers well grouted.*

*B. J. C.*





Pointed and Grouted  
with Rosencoke

75'

Slope

15.0'

50'

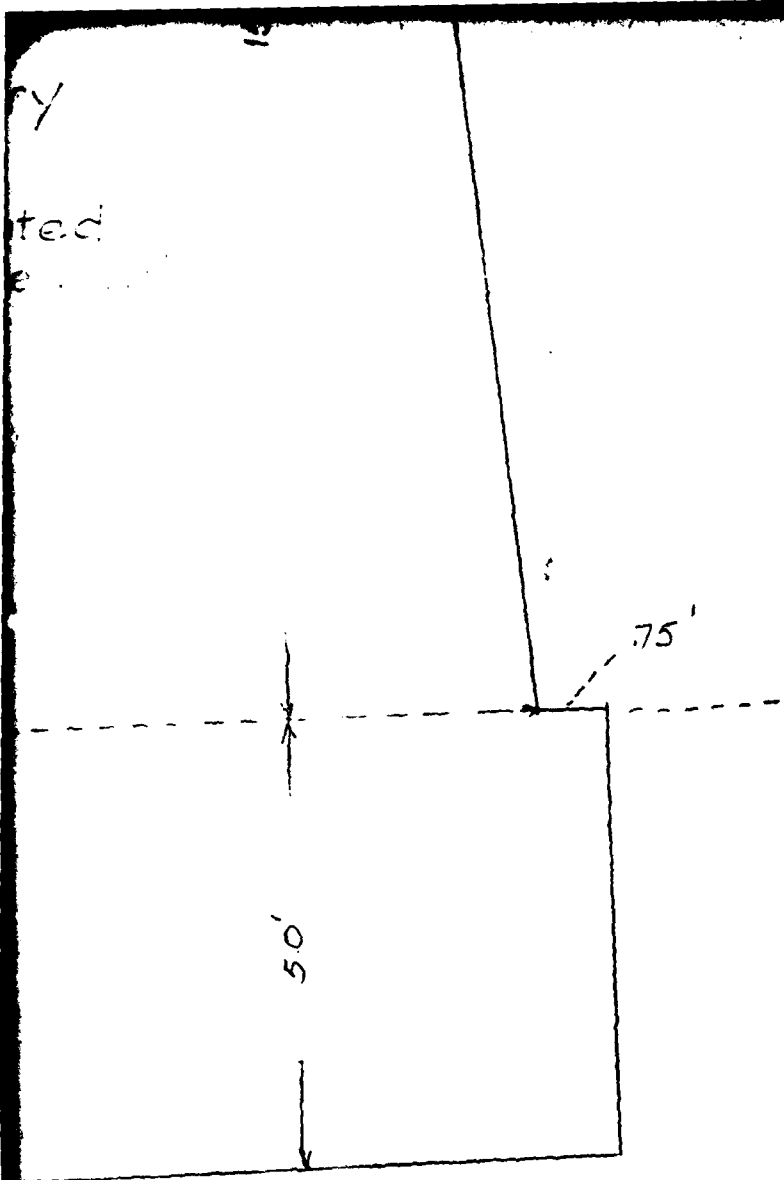
3" sheet piling

5.0'

Hard pan and

3

Section of W

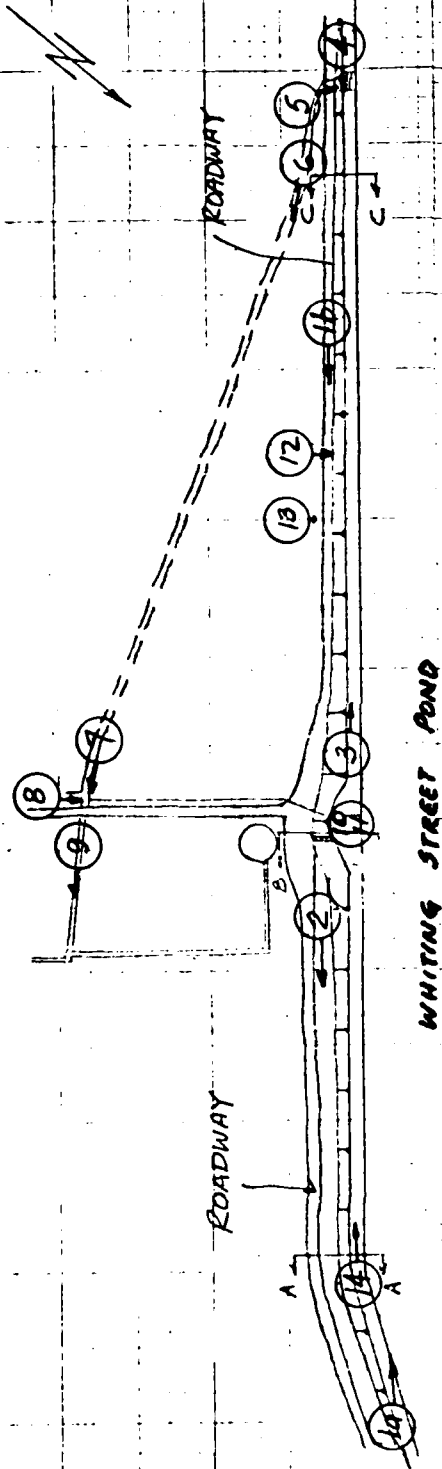


Hard pan and Gravel

Section of Whiting St.  
4

PHOTOGRAPHS

APPENDIX C



TAMS	STATE ENGINEER	STATE ENGINEER
BROOKLINE	MASS	MASS
NATIONAL PROGRAM OF INSPECTION OF NON-FED. DAMS		
WHITING STREET POND		
PHOTOGRAPH LOCATION GUIDE		
CONNECTICUT RIVER BASIN		MASS
SCALE: N.T.S.		DATE: AUG 78

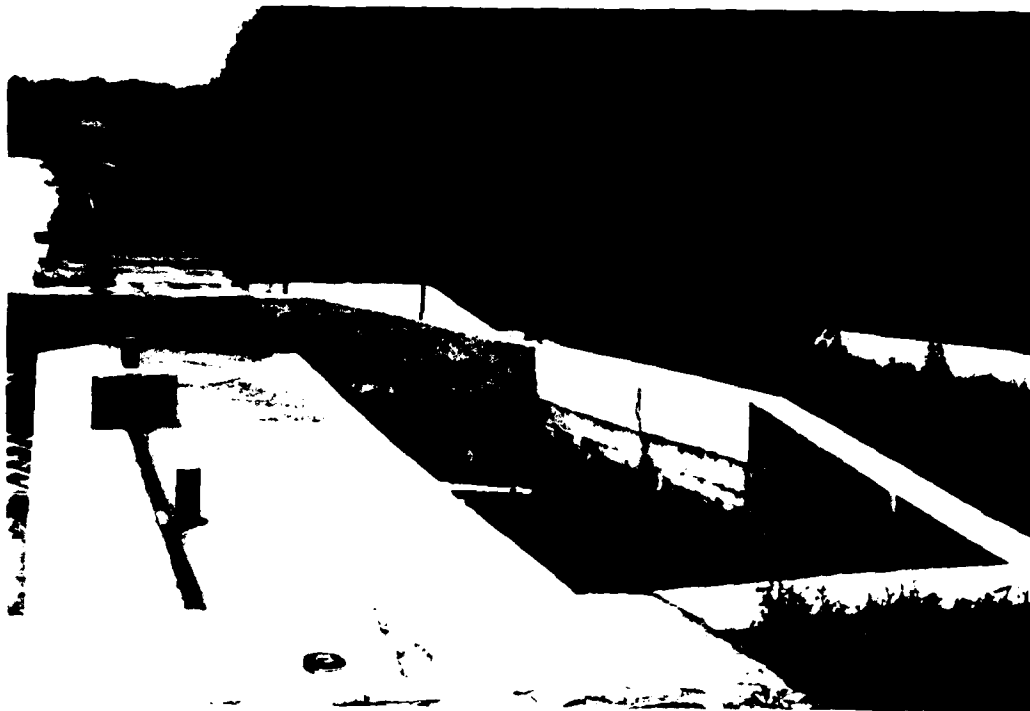


2. VIEW OF DOWNSTREAM SLOPE NORTH OF GATE HOUSE.

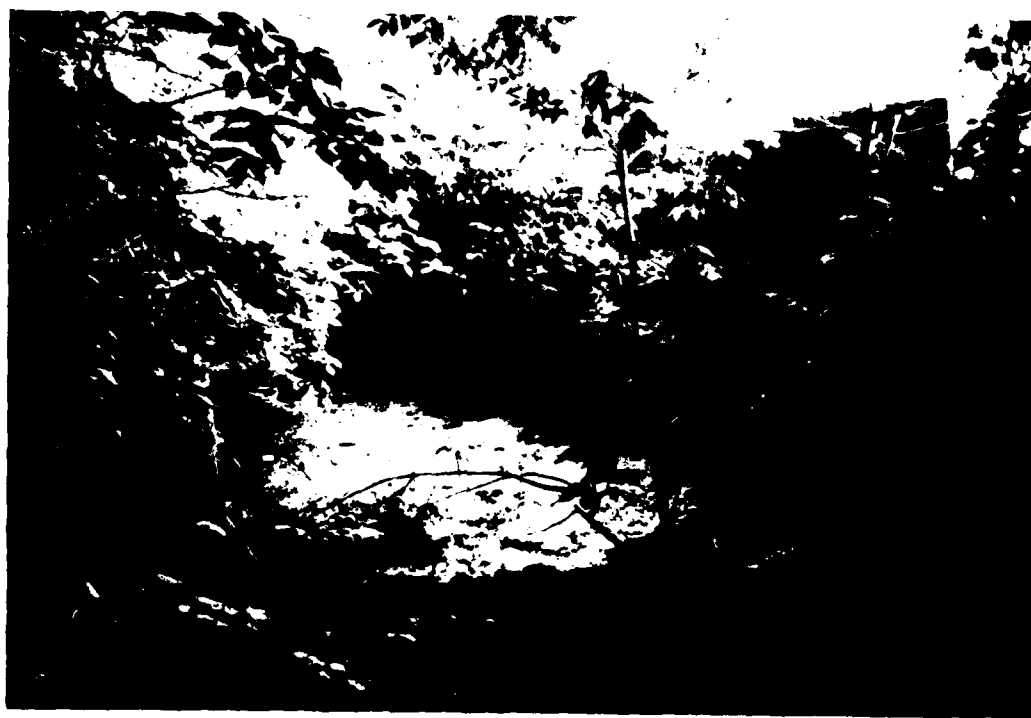


3. VIEW ALONG CREST LOOKING SOUTH.  
NOTE COMBINED STONE AND EARTH CREST.





4. VIEW OF SPILLWAY LOOKING NORTH. NOTE CONDITION OF CONCRETE



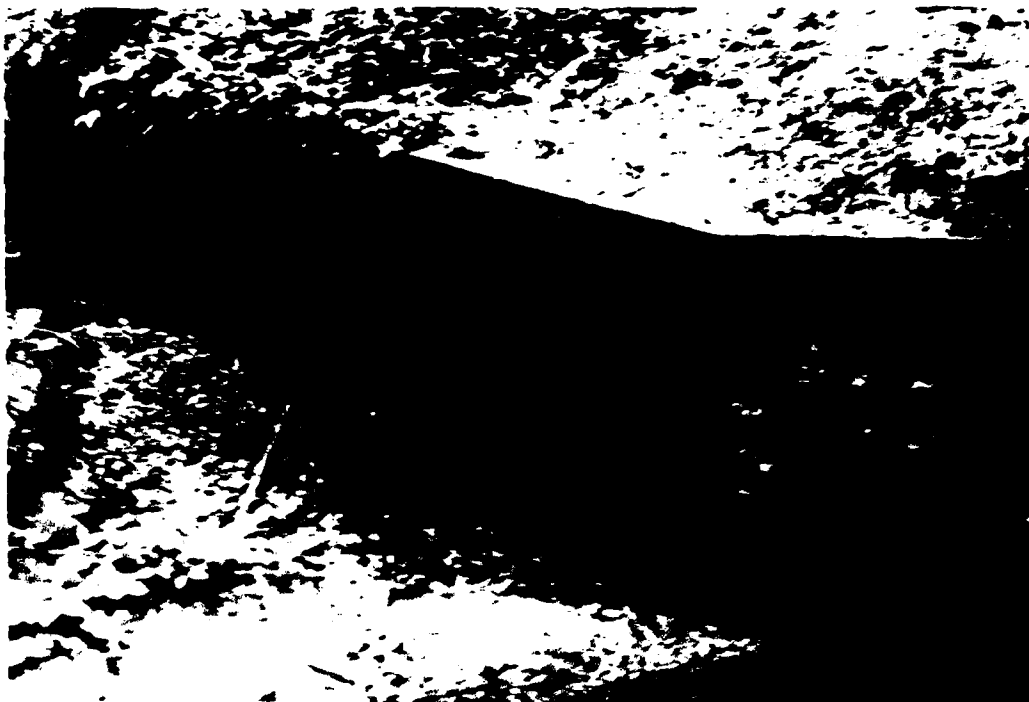
5. VIEW OF ROADWAY BRIDGE OVER SPILLWAY CHANNEL LOOKING UPSTREAM  
NOTE VEGETATION, DEBRIS AND CONDITION OF CONCRETE



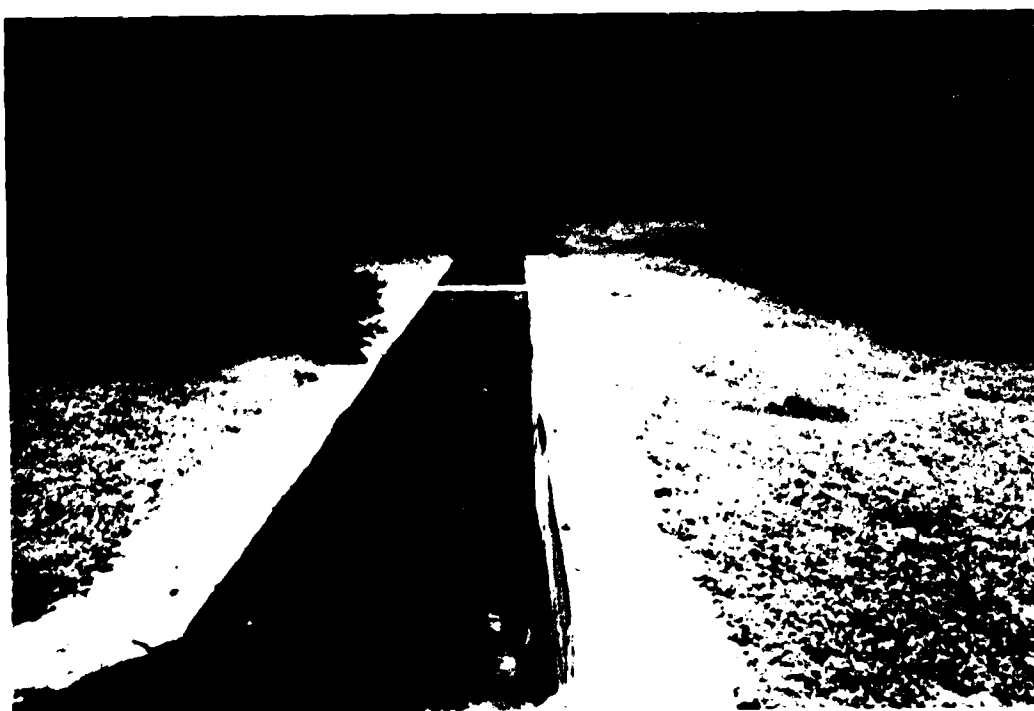
6. VIEW OF NATURAL SPILLWAY CHANNEL LOOKING DOWNSTREAM.



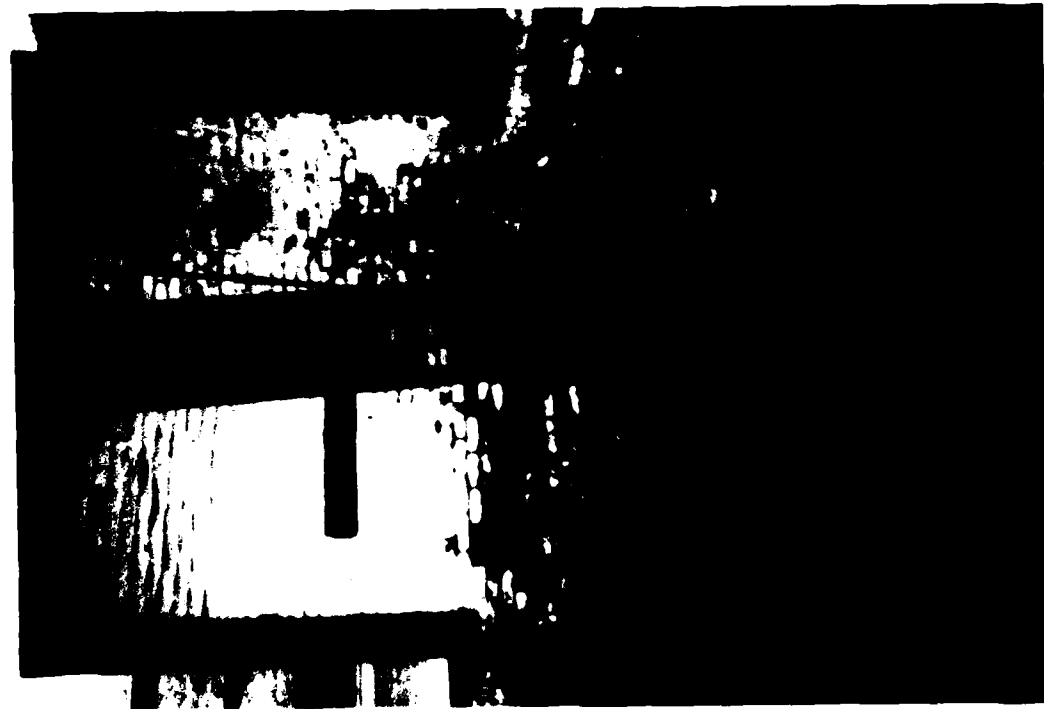
7. VIEW OF SPILLWAY CHANNEL LOOKING DOWNSTREAM.  
NOTE LOW LEVEL OUTLET LEFT SIDE, 48-INCH DIAMETER INLET  
RIGHT SIDE AND CONTINUATION UNDER BRIDGE.



8. VIEW OF LOW LEVEL OUTLET PIPE OUT FALLING INTO SPILLWAY CHANNEL  
NOTE CONDITIONS OF CONCRETE AND STONE MASONRY



9. DOWNSTREAM VIEW OF CONCRETE LINED SPILLWAY CHANNEL  
NOTE DETERIORATION OF CONCRETE AT BASE OF WALL



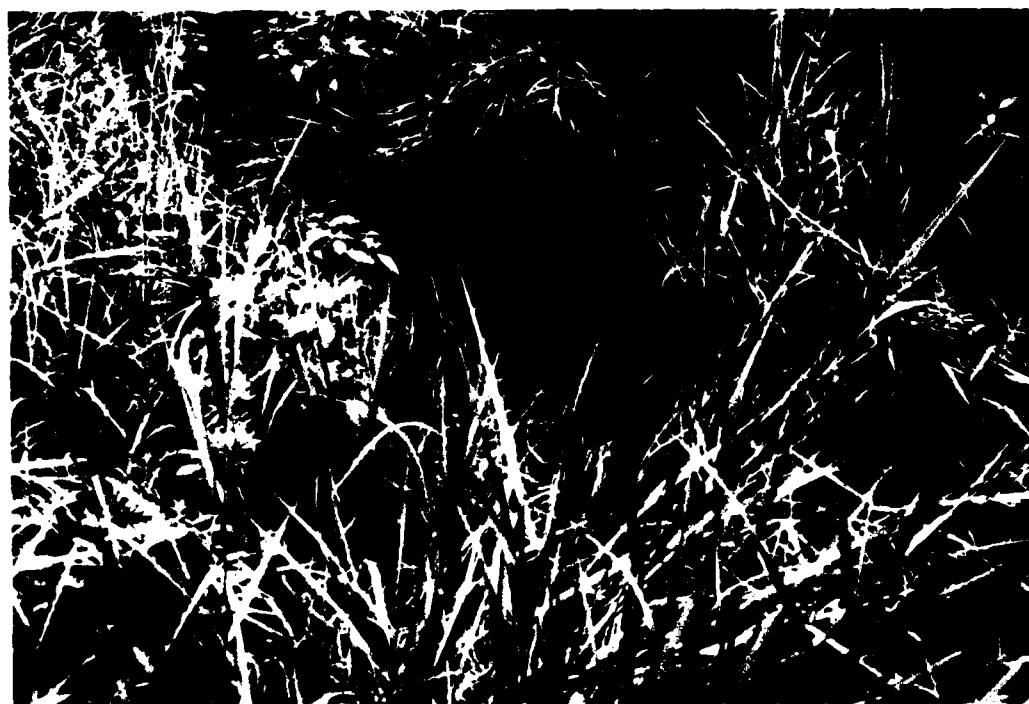
10. VIEW INSIDE GATE HOUSE.  
NOTE SLUICEGATE OPERATING STAND  
AND LOW LEVEL OUTLET GATE VALVE STEM.



11. VIEW INSIDE GATE HOUSE.  
NOTE OPERATING STAND FOR 16 INCH  
WATER SUPPLY LINE AND STEM FOR BY PASS  
GATE VALVE.



12. VIEW OF OUTLET PIPE AT DOWNSTREAM TOE OF DAM  
INLET AND CONTROLS ARE UNKNOWN



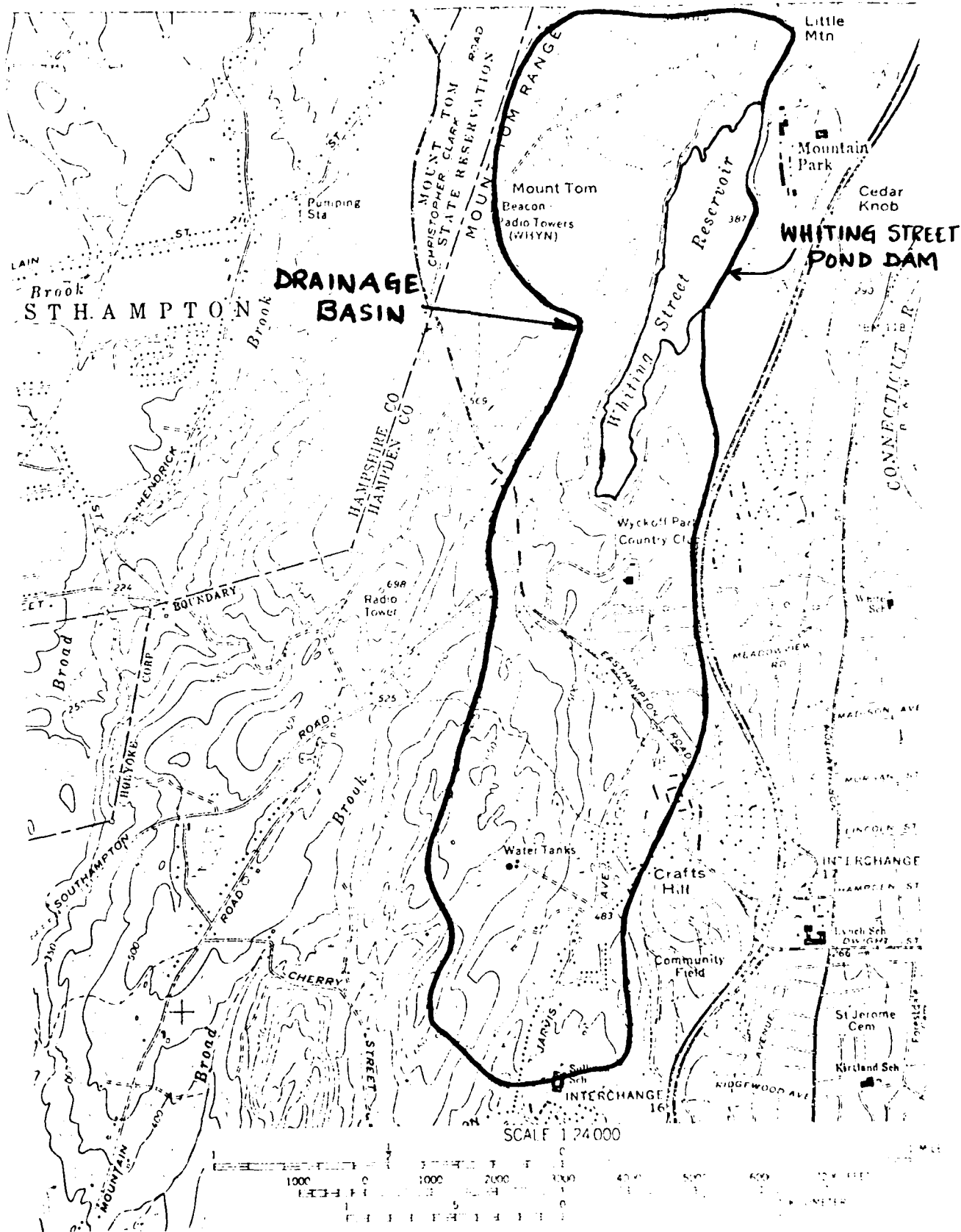
13. VIEW OF SEEPAGE AT DOWNSTREAM TOE OF DAM



14. CLOSE UP VIEW OF POINTING ON UPSTREAM STONE MASONRY FACE  
NOTE MISSING MORTAR AND VEGETATION IN JOINTS

HYDROLOGIC DATA AND COMPUTATIONS

APPENDIX D



SCALE 1:24,000  
CONTOUR INTERVAL 10 FEET  
LAT. & LONG. COORDINATES



Job No. 1497-03 TIPPETTS-ABBETT-McCARTHY-STRATTON  
ENGINEERS AND ARCHITECTS NEW YORK

Project DAM INSPECTION

Subject WHITING STREET RESERVOIR

SURCHARGE STORAGE CAL.

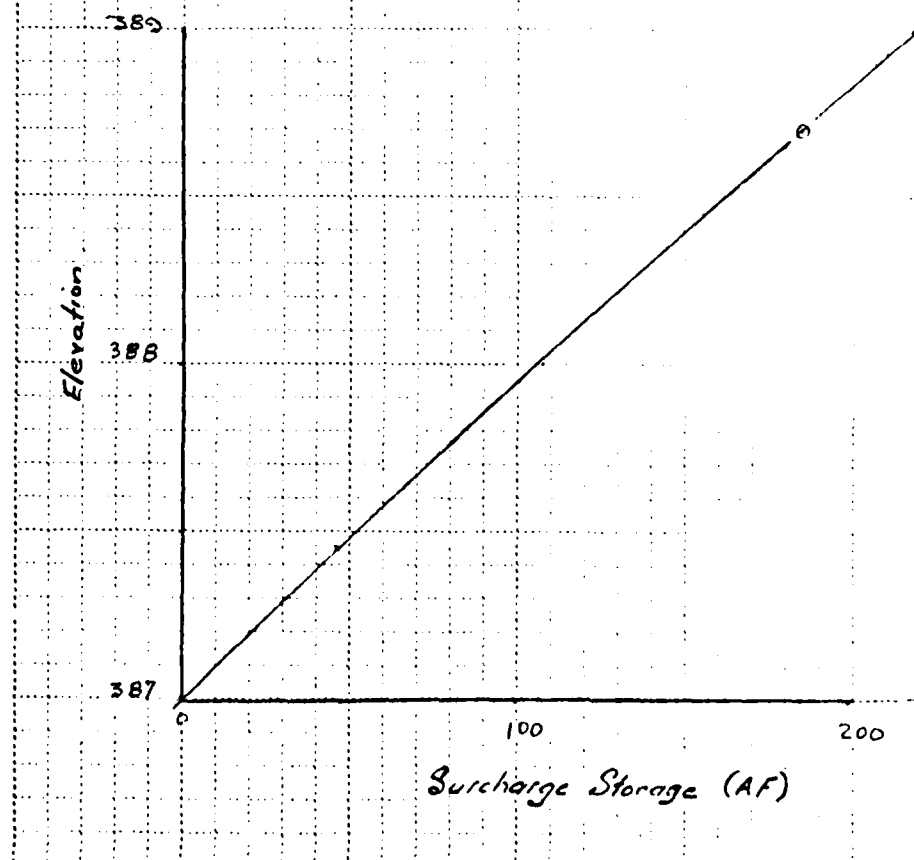
Sheet 1 of 9

Date 7/31/78

By M. GONZALEZ

Chk. by       

ELEV. (FE)	AREA (ACRES)	AREA (AVE.)	$\Delta$ VOLUME (AF)	SURCHARGE VOL. (AF)
387	102			0
388	109	106	106	106
389	115	112	112	218
390	120	118	118	336
391	123	122	122	458
392	127	125	125	583



# TAMS

Job No. 1497-03

Project INSPECTION WHITING STREET DAM.

Subject P.M.F inflow computation.

Sheet 2 of 9

Date Aug 14, 78

By D.L.C.

Ch'k. by \_\_\_\_\_

Incremental depth of Probable Maximum  
Precipitation in Inches at 15 min. interval:

TOTAL AREA: 1.67 sq mi  
(1069 acres)

Time (hours)	TOTAL Precipitation	LAKE Runoff (cfs)	Basin Runoff (cfs)	TOTAL Runoff (cfs)
0.00	0	0	0	0
.25	0.373	182	554	736
1.50	0.373	182	1381	1563
.75	0.391	191	1412	1603
1.00	0.426	208	1518	1726
.25	0.817	399	2279	2678
.50	0.941	459	3491	3950
.75	0.941	459	3809	4268
2.00	3.77	1.066	4024	4544
.25	1.225	598	4652	5250
.50	1.670	815	5787	6602
.75	2.255	1100	7929	9029
3.00	6.57	1.421	7957	8656
.25	0.853	416	4887	5303
.50	0.728	355	3219	3574
.75	0.657	321	2777	3098
4.00	2.81	0.568	2442	2719
.25	0.498	243	2094	2337
.50	0.444	217	1823	2040
.75	0.444	217	1685	1902
5.00	1.79	0.408	1623	1830
.25	0.337	164	1408	1572
.50	0.320	156	1193	1349
.75	0.319	156	1165	1321
6.00	1.26	0.285	1002	1031

PMF

LAKE AREA 102 acres (0.16 sq mi) No Losses

Basin Area 947 acres (1.48 sq mi) 0.2 inch loss/hour

# TAMS

Job No. 1497-03

Sheet 3 of 9

Project INSPECTION WHITING STREET DAM

Date AUG 14, 78

Subject Computation of Inflow for overland sub-basin

By D L C

ANCUS

Ch'k. by \_\_\_\_\_

EXCESS RAINFALL	Sub-basin x(640x4)	Sub-basin x(420x4)	TOTAL
0	-	-	0
0.323	-	554	554
0.323	827	554	1381
0.341	827	555	1412
.376	873	645	1518
.767	963	1316	2279
.891	1963	1528	2491
.891	2281	1528	3809
1.016	2281	1743	4024
1.175	2601	2015	4652
1.620	3008	2779	5787
2.205	4147	3782	7929
1.371	5645	2352	7997
.803	3510	1377	4887
.678	2056	1163	3219
.607	1736	1041	2777
.518	1554	888	2442
.448	1326	768	2094
.394	1147	676	1823
.394	1009	676	1685
.358	1009	614	1623
.287	916	492	1408
.270	735	463	1198
.269	704	461	1165
.235	689	403	1092

<u>1/2 PM F</u> cfs
0
368
181
802
862
1339
1975
2134
2272
2625
3201
4515
4245
2052
1787
1549
1360
1164
1020
451
911
786
677
661
616

# TAMS

Job No. \_\_\_\_\_

Project \_\_\_\_\_

Subject \_\_\_\_\_

INSPECTION WHITING STREET RESERVOIR

SPILLWAY HEAD-DISCHARGE RATING

Sheet 4 of 9

Date AUG 14, 78

By DLC

Ch'k. by \_\_\_\_\_

Spillway Crest AT Two Levels  
Low Side ASSUMED TO BE AT ELEVATION 387.0'

'HIGH' SIDE AT ELEVATION 387.45

$$Q = CLH^{3/2}$$

Low Side (L=165)

High Side (L=170)

Elev	H	C	Q <sub>1</sub>	H	C	Q <sub>2</sub>	TOTAL Q
387.	0	0	0				0
387.45	.45	3.58	17.8	0	0	0	18
387.95	.95	3.57	54.5	.50	3.55	21.5	76
388.45	1.45	3.57	102.8	1.00	3.57	60.7	164
388.7	1.70	3.56	130.2	1.25	3.57	84.8	215
389.0							834
390.0							7360

N.B. above El 388.7 it is assumed that flow will occur over the entire 1,880 feet length of the dam.

# TAMS

Job No. 1497-03

Project INSPECTION WHITING STREET RESEVOIR

Subject INPUT FOR ROUTING

Sheet 5 of 9

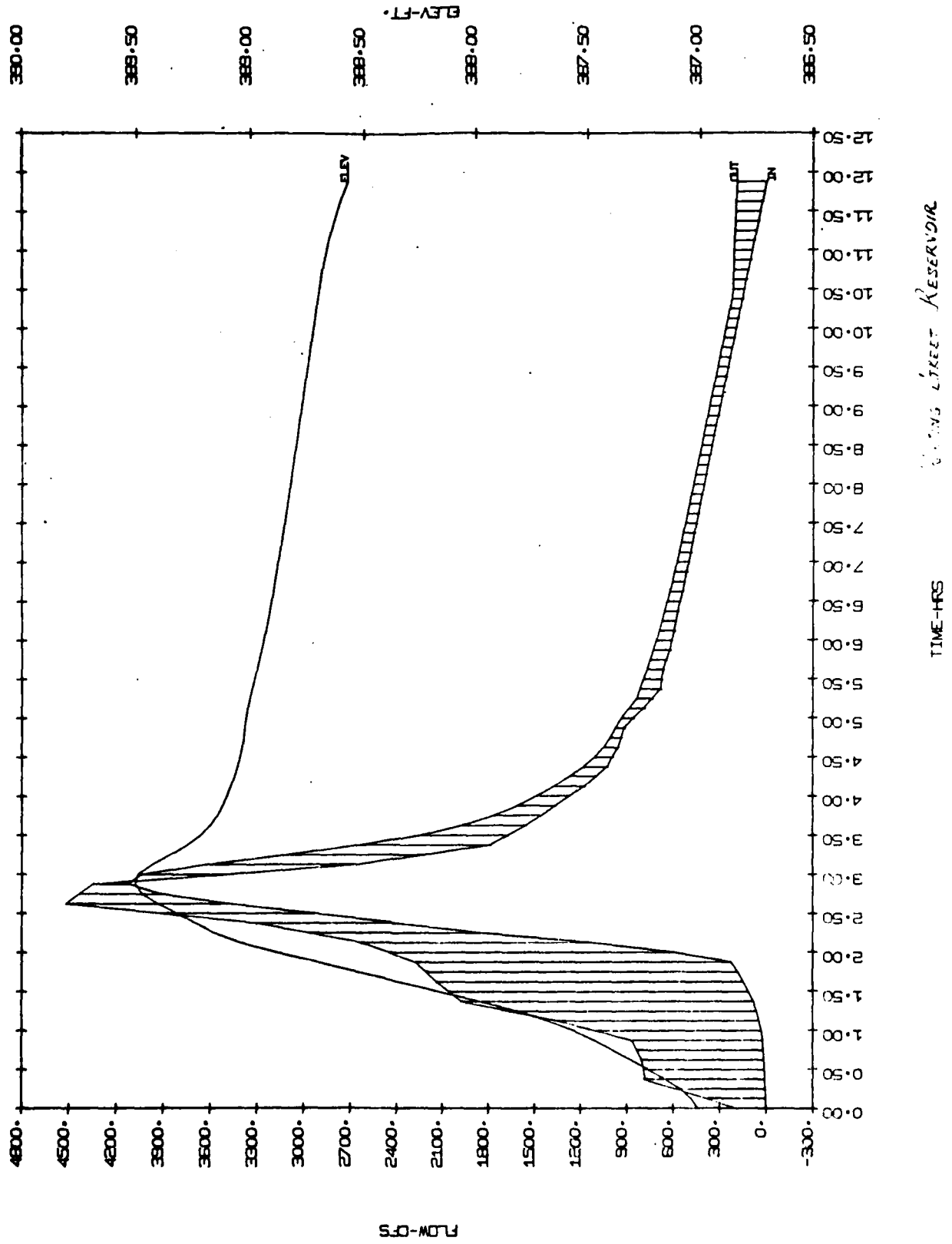
Date AUG 14 78

By D L C

Ch'k. by \_\_\_\_\_

ELEVATION	OUTFLOW (CFS)	STORAGE (AF)
387.0	0	0
387.45	18	47
387.95	76	100
388.45	164	155
388.70	215.	185
389	830	218
390	7360	336

TOP OF DAM



1497-03

WHITING STREET DAM  
DAM INSPECTION  
INFLOW HYDROGRAPH PMF

INPUT PARAMETERS

STARTING ELEV. (FT.)	TIME INTERVAL (HOURS)	STARTING TIME (HOURS)	ENDING TIME (HOURS)	PRINT INTERVAL (HOURS)	GATE OPTION	PLOT OPTION	STORAGE COEF.	OUTFLOW COEF.	INFLOW COEF.	TIME COEF.	BREAK TIME
387.00	0.25	0.00	6.25	1	NO	YES	1.000	1.000	1.000	1.000	0.000
RESERVOIR											
ELEV. (FT.)				STORAGE (ACFT)				RESERVOIR OUTFLOW (CFS)			
387.00				0.0000				0.00			
387.45				47.0000				18.00			
387.95				100.0000				76.00			
388.45				155.0000				164.00			
388.70				185.0000				215.00			
389.00				218.0000				830.00			
390.00				336.0000				7360.00			

TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
0.00	0.00		0.0000	387.00
0.25	735.00	2.90	7.5733	387.07
0.50	1563.00	11.93	31.1698	387.29
0.75	1603.00	36.01	63.4577	387.60
1.00	1726.00	72.41	96.7267	387.91
1.25	2678.00	140.05	140.0351	388.31
1.50	3950.00	557.19	203.3616	388.86
1.75	4268.00	2735.94	252.4412	389.29
2.00	4564.00	3850.92	272.5895	389.46
2.25	5250.00	4549.32	285.2098	389.56
2.50	6602.00	5468.43	301.8186	389.71
2.75	9029.00	7035.41	330.1346	389.95
3.00	8690.00	8253.23	352.1411	390.13
3.25	5303.00	7414.19	336.9794	390.00
3.50	3574.00	5427.52	301.0793	389.70
3.75	3094.00	4031.15	275.8463	389.49
4.00	2719.00	3281.63	262.3021	389.37
4.25	2337.00	2778.48	253.2099	389.29
4.50	2640.00	2384.59	246.0921	389.23
4.75	1902.00	2108.46	241.1024	389.19
5.00	1522.00	1943.91	238.1289	389.17
5.25	1572.00	1779.06	235.1500	389.14
5.50	1354.00	1568.04	231.8369	389.14
5.75	1321.12	1414.12	228.5554	389.08
6.00	221.10	1321.90	226.4690	389.07
6.25	0.00	135.37	218.0971	389.00

MAX. VALUES  
MIN. VALUES

9324.00  
0.00

8253.23  
0.00

390.13  
387.00



TIME (HRS)	INFLOW (CFS)	OUTFLOW (CFS)	STORAGE (ACFT)	ELEVATION (FT.)
6.13	603.16	702.92	211.1816	386.93
6.25	590.33	694.33	210.1838	388.92
6.38	577.50	666.74	206.2402	388.92
6.50	564.66	646.99	206.3412	388.91
6.63	551.83	633.92	207.4791	388.90
6.75	539.00	618.42	206.6473	388.89
6.88	526.16	603.39	205.8406	388.88
7.00	513.33	589.74	205.0546	388.88
7.13	500.50	576.41	204.2857	388.87
7.26	487.66	560.34	203.5308	388.86
7.38	474.83	546.49	202.7875	388.86
7.50	462.00	532.82	202.0538	388.85
7.63	449.16	519.29	201.3280	388.84
7.75	436.33	505.89	200.6087	388.84
7.88	423.50	492.58	199.8946	388.83
8.00	410.66	479.36	199.1853	388.82
8.13	397.83	466.20	198.4794	388.82
8.25	385.00	453.11	197.7766	388.81
8.38	372.16	440.03	197.0763	388.80
8.50	359.33	427.04	196.3750	388.80
8.63	346.50	414.06	195.6814	388.79
8.75	333.66	401.10	194.9862	388.79
8.88	320.83	388.17	194.2822	388.78
9.00	308.00	375.25	193.5951	388.77
9.13	295.16	362.35	192.9068	388.77
9.25	282.33	349.46	192.2152	388.76
9.38	269.50	336.58	191.5240	388.75
9.50	256.66	323.71	190.8333	388.75
9.63	243.83	310.84	190.1430	388.74
9.75	231.00	297.98	189.4530	388.74
9.88	218.16	285.13	188.7632	388.73
10.00	205.33	272.28	188.0736	388.72
10.13	192.50	259.43	187.3842	388.72
10.25	179.66	246.58	186.6949	388.71
10.38	166.83	233.74	186.0054	388.70
10.50	154.00	220.90	185.3167	388.70
10.63	141.16	214.33	184.6317	388.69
10.75	128.33	212.55	183.9467	388.68
10.88	115.50	211.36	183.2644	388.68
11.00	102.66	207.55	182.5870	388.67
11.13	89.83	207.61	181.9170	388.66
11.25	77.00	205.45	181.2545	388.65
11.38	64.16	203.13	180.5933	388.64
11.50	51.33	200.57	179.9345	388.62
11.63	38.50	197.85	179.2785	388.61
11.75	25.66	194.97	178.6231	388.60
11.88	12.83	191.92	177.9695	388.59
12.00	0.00	188.69	177.3239	388.57
MAX. VALUES				389.50
MIN. VALUES				387.00

APPENDIX E  
INFORMATION AS CONTAINED IN  
THE NATIONAL INVENTORY OF DAMS



# INVENTORY OF DAMS IN THE UNITED STATES

STATE	IDENTITY NUMBER	UNIFORM	STATE	COUNTY	CONSTR.	COUNTY	DATE	NAME	LATITUDE (NORTH)	LONGITUDE (WEST)	REPORT DATE
MA	70	NED	MA	013	01			WHITING STREET POND DAM	4214.4	7238.1	08SEP78

POPULAR NAME	NAME OF IMPOUNDMENT
	WHITING STREET RESERVOIR

REGION	DASH	RIVER OR STREAM	NEAREST DOWNSTREAM CITY-TOWN-VILLAGE	DATE FROM DAM (MI.)	POPULATION
01	08	TR-CONNECTICUT	MOLYKE	0	50100

TYPE OF DAM	YEAR COMPLETED	PURPOSES	STAGE HEIGHT (FT.)	HYDRAULIC HEIGHT (FT.)	IMPOUNDING CAPACITIES (ACRE-FT.)	DIST	OWN	FED	R	PRV	VED	SCS	A	VER/DATE
REGPS	1900	S	19	17	2190	2005	NED	N	N	N	N	N	N	31AUG78

REMARKS

D/S HAS	SPILLWAY	MAXIMUM DISCHARGE (CFS)	VOLUME OF DAM (CU YD)	POWER CAPACITY (KW)	INSTALLED	PROPOSED	NO.	LENGTH (FT.)	WIDTH (FT.)	LENGTH (FT.)	WIDTH (FT.)
1	1900	U	34	215							

OWNER	ENGINEERING BY	CONSTRUCTION BY
CITY OF MOLYKE		

DESIGN	CONSTRUCTION	OPERATION	MAINTENANCE
NONE	NONE	NONE	NONE

INSPECTION BY	INSPECTION DATE	AUTHORITY FOR INSPECTION
TIPPETT-ABBETT-MCCARTHY-STRATTON	PL 92-367	

REMARKS

**DATE**  
**ILME**